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TRANSACTIONS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

VOL. IX.

FOR THE YEAR 1896.

PHILADELPHIA:
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1897.

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AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

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NOTE.

THE Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

WILLIAM WARREN POTTER, *Secretary*,
284 FRANKLIN STREET, BUFFALO.

[MINUTES and discussions stenographically reported by WILLIAM WHITFORD, Chicago, Ill.]

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ERRATUM.

On page 24, seventh line from bottom, *for* "Professor of the," *read* "President of the".

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

CONSTITUTION.

I. The name of this Association shall be THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

II. Its object shall be the cultivation and promotion of knowledge in whatever relates to Abdominal Surgery, Obstetrics, and Gynecology.

MEMBERS.

III. The members of this Association shall consist of Ordinary Fellows, Honorary Fellows, and Corresponding Fellows.

The Ordinary Fellows shall not exceed one hundred and fifty in number.

The Honorary Fellows shall not exceed ten American and twenty-five foreign.

Candidates shall be proposed to the Executive Council at least one month before the first day of meeting by two Fellows, and shall be balloted for at the annual meeting, a list of names having been sent to every Fellow with the notification of the meeting.

A two-thirds vote in the affirmative of all the members present shall be necessary to elect—fifteen Fellows at least being in attendance.

Candidates for active fellowship shall submit to the Executive Council, at least one month before the annual meeting, an original paper relating to Abdominal Surgery, Obstetrics, or Gynecology.

HONORARY FELLOWS.

IV. The power of nominating Honorary Fellows shall be vested in the Executive Council.

Their election shall take place in the same manner as that of Ordinary Fellows.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, but shall not be required to pay any fee.

CORRESPONDING FELLOWS.

V. The Corresponding Fellows shall be recommended by the Executive Council, and elected by the Association.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, and shall be entitled to a copy of the annual *Transactions*.

They shall pay an annual fee of five dollars.

OFFICERS.

VI. The officers of this Association shall be a President, two Vice-presidents, a Secretary, a Treasurer, and five Executive Councillors.

The nomination of all officers shall be made by the Executive Council in open session at the business meeting, and the election shall be by ballot.

The officers shall enter upon their duties immediately before the adjournment of the meeting at which they shall be elected, and shall hold office for one year.

Any vacancy occurring during the recess may be filled temporarily by the Executive Council.

ANNUAL MEETINGS.

VII. The time and place of holding the annual meeting shall be determined by the Association or may be committed to the Executive Council each time before adjournment.

It shall continue for three days, unless otherwise ordered by vote of the Executive Council.

AMENDMENTS.

VIII. This Constitution may be amended by a two-thirds vote of all the Fellows present at the annual meeting; *provided* that notice of the proposed amendment shall have been given in writing at the business session of the annual meeting next preceding; and *provided further*, that such notice shall have been published in the notification of the meeting at which the vote is to be taken.

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

BY-LAWS.

THE PRESIDING OFFICER.

I. The President, or in his absence one of the Vice-presidents, shall preside at all meetings, and perform such other duties as ordinarily pertain to the Chair.

The presiding officer shall be *ex-officio* chairman of the Executive Council, but shall vote therein only in case of a tie.

SECRETARY.

II. The Secretary shall attend and keep a record of all meetings of the Association and of the Executive Council, of which latter he shall be *ex-officio* clerk, and shall be entitled to vote therein.

He shall collect all moneys due from the members, or other sources, and shall pay the same over to the Treasurer, taking his receipt therefor.

He shall supervise and conduct all correspondence of the Association; he shall superintend the publication of the *Transactions* under the direction of the Executive Council, and shall perform all the ordinary duties of his office.

He shall be the custodian of the seal, books, and records of the Association.

TREASURER.

III. The Treasurer shall receive all moneys from the Secretary, pay all bills, and render an account thereof at the annual meetings, when an Auditing Committee shall be appointed to examine his accounts and vouchers.

EXECUTIVE COUNCIL.

IV. The Executive Council (composed of the officers named in Sec. VI. Constitution) shall meet as often as the interests of the Association may require. The President, or any three members, may call a meeting, and a majority shall constitute a quorum.

It shall have the management of the affairs of the Association, subject to the approval of the house at its annual meetings.

It shall have control of the publications of the Association, with full power to accept or reject papers or discussions.

It shall have control of the arrangements for the annual meetings, and shall determine the order of the reading of papers.

It shall constitute a court of inquiry for the investigation of all charges against members for offences involving law or honor; and it shall have the sole power of moving the expulsion of any Fellow.

ORDER OF BUSINESS.

V. The Order of Business at the annual meetings of the Association shall be as follows:

1. General meeting at an hour appointed by the Executive Council.
   - *a.* Reports of Committees on Scientific Questions.
   - *b.* Reading of Papers and Discussion of the same.
2. One Business meeting shall be held at half-past nine o'clock A.M. on the first day of the session, and another on the evening of the second day (unless otherwise ordered by vote), at which only the Fellows of the Association shall be present. At these meetings the Secretary's Record shall be read; the Treasurer's Accounts submitted; the Reports of Committees on other than scientific subjects offered; and all Miscellaneous Business transacted.

PAPERS.

VI. The titles of all papers to be read at any annual meeting shall be furnished to the Secretary *not later* than one month before the first day of the meeting.

No paper shall be read before the Association that has already been published, or that has been read before any other body.

Not more than twenty minutes shall be occupied in reading any paper before the Association.

Abstracts of all papers read should be furnished to the Secretary at the meeting.

All papers read before the Association shall become its sole property if accepted for publication; and the Executive Council may decline

to publish any paper not handed to the Secretary *complete* before the final adjournment of the annual meeting.

QUORUM.

VII. The Fellows present shall constitute a quorum for all business, excepting the admission of new Fellows or acting upon amendments to the Constitution, when not less than fifteen Fellows must be in attendance.

DECORUM.

VIII. No remarks reflecting upon the personal or professional character of any Fellow shall be in order at any meeting, except when introduced by the Executive Council.

FINANCE.

IX. Each Fellow on admission shall pay an initiation fee of twenty-five dollars, which shall include his dues for the first year.

Every Fellow shall pay *in advance* (*i. e.*, at the beginning of each fiscal year) the sum of twenty dollars annually thereafter.

[A fiscal year includes the period of time between the first day of one annual meeting and the first day of the next.]

Any Fellow neglecting to pay his annual dues for two years may forfeit his membership, upon vote of the Executive Council.

The Secretary shall receive annually a draft from the President drawn on the Treasurer for a sum, to be fixed by the Executive Council, for the services he shall have rendered the Association during the year.

A contingent fund of one hundred dollars shall be placed annually at the disposal of the Secretary for current expenses, to be disbursed by him, and for which he shall present proper vouchers.

ATTENDANCE.

X. Any Fellow who shall neither attend nor present a paper for three consecutive years, unless he offer a satisfactory excuse, may be dropped from fellowship upon vote of the Executive Council.

RULES.

XI. *Robert's Rules of Order* shall be accepted as a parliamentary guide in the deliberations of the Association.

AMENDMENTS.

XII. These By-laws may be amended by a two-thirds vote of the Fellows present at any meeting; *provided*, previous notice in writing shall have been given at the business session of the annual meeting next preceding the one at which the vote is to be taken.

OFFICERS FOR 1896–1897.

PRESIDENT.

JAMES FREDERICK WILLIAM ROSS, Toronto.

VICE-PRESIDENTS.

GEORGE BEN JOHNSTON, Richmond.
JOHN CHASE SEXTON, Rushville.

SECRETARY.

WILLIAM WARREN POTTER, Buffalo.

TREASURER.

XAVIER OSWALD WERDER, Pittsburg.

EXECUTIVE COUNCIL.

CHARLES ALFRED LEE REED, Cincinnati.
ALBERT VANDER VEER, Albany.
LEWIS SAMUEL McMURTRY, Louisville.
J. HENRY CARSTENS, Detroit.
WILLIAM E. B. DAVIS, Birmingham.

HONORARY FELLOWS.

* Deceased.

1889.—Bantock, George Granville, M.D., F.R.C.S. Ed. Surgeon to the Samaritan Free Hospital. 12 Granville Place, Portman Square W., London, England.

1889.—Barbour, A. H. Freeland, M.A., B.S.C., M.D., F.R.C.P. Ed., F.R.S. Ed. Lecturer on Midwifery and Diseases of Women in the Edinburgh Medical School; Assistant Physician to the Royal Maternity Hospital; Assistant Physician for Diseases of Women to the Royal Infirmary; Physician to the Women's Dispensary; Fellow of the Edinburgh and London Obstetrical Societies and of the British Gynecological Society; Corresponding Fellow of the Royal Academy of Medicine, Turin. 4 Charlotte Square, Edinburgh, Scotland.

1892.—*Boislinière, L. Ch., A.B., M.D., LL.D. 1896.

1890.—Championnière, Just. Lucas-, M.D. 3 Avenue Montaigne, Paris, France.

1889.—Charpentier, Arthur Louis Alphonse, M.D. Fellow of the Faculty of Medicine of Paris; Member of the Academy of Medicine; and Chevalier of the Legion of Honor. 66 Rue de Miromesnil, Paris, France.

1888.—Cordes August, Elisée, M.D. Member of the Royal College of Physicians, London; Fellow of the Obstetrical Society of London and of the British Gynecological Society; Corresponding National Member of the Obstetrical and Gynecological Society of Paris; Honorary Fellow of the Detroit Gynecological Society; late "Chirurgien-adjoint" of the Obstetrical and Gynecological Clinic at the Maternity at Geneva; Consulting Accoucheur of the Miséricorde Hospital, etc.; Perpetual Member of the Société Obstétricale de France, Paris, France. 12 Rue Bellot, Geneva, Switzerland.

1890.—*Corson, Hiram, M.D. 1896.

1889.—Croom, J. Halliday, M.D., F.R.C.P.E., F.R.C.S.E., F.R.S.E. Physician to and Clinical Lecturer on Diseases of Women, Royal Infirmary, Edinburgh; Physician to the Royal Maternity Hospital; Lecturer on Midwifery and the Diseases of Women at the

School of Medicine; Consulting Physician for Diseases of Women, Western Dispensary. 25 Charlotte Square, Edinburgh, Scotland.

1889.—*Dunlap, Alexander, A.M., M.D. Springfield, O. 1894.

1888.—*Edis, Arthur Wellesley, M.D. Lond., F.R.C.S., M.R.S.C.S. London, England. 1893.

1889.—Eklund, Abraham Fredrik, M.D. 3 A. Sibyllegatan, Stockholm, Sweden.

1891.—Fernandez, Juan Santos, M.D. Calle de la Reina, No. 92, Havana, Cuba.

1891.—*Fisher, George Jackson, A.M., M.D. Sing Sing, N. Y. 1893.

1889.—Freund, William Alexander, M.D. Professor and Director of the Clinic for Diseases of Women, in the Emperor William University. 2 Nikolaustaden, Strassburg, Germany.

1892.—Green, Traill, M.D., LL.D. Emeritus Professor of Chemistry in Lafayette College; Member of the American Medical Association; Member (President, 1867) of the Medical Society of the State of Pennsylvania; Fellow of the American Association for the Advancement of Science; Member of the American Philosophical Society; President of the Section of Therapeutics and Materia Medica, Ninth International Medical Congress; Consulting Physician to St. Luke's Hospital, Bethlehem; Physician to the Home for Friendless Children, Easton; Consulting Surgeon to Easton Hospital; Ex-President of the American Academy of Medicine. 222 Spring Garden St., Easton, Pa.

1896.—Gaston, James McFadden, A.M., M.D. Professor of Surgery in the Southern Medical College, Atlanta; Fellow of the American Surgical Association; Member of the Southern Surgical and Gynecological Association. 421 Capitol Avenue, Atlanta, Ga.

1894.—Jacobs, Charles, M.D. Professor of the Faculty of Medicine of Brussels; Secretary-General of the Permanent Committee of the Periodic International Congress of Gynecology and Obstetrics; Vice-President of the Belgian Society of Gynecology and Obstetrics; Surgeon to the Brussels Polyclinic. 53 Boulevard de Waterloo, Brussels, Belgium.

1889.—Keith, Thomas, M.D. 42 Charles Street, Berkeley Square W., London, England.

1889.—Leopold, G., M.D. Professor in the Royal Clinic for Diseases of Women. 12 Seminar-Strasse, Dresden, Germany.

1894.—Maclean, Donald, M.D. President of the American Medical Association 1894. 72 Lafayette Avenue, Detroit, Mich.

1890.—Martin, August, M.D. Alexanderufer 1, Berlin N. W., Germany.

1895.—Mastin, Claudius Henry, M.D., LL.D. Senior Consulting Surgeon, City Hospital, Mobile; Ex-President American Surgical Association; President American Association Genito-urinary Surgeons; Corresponding Member Boston Gynecological Society; Member of Southern Surgical and Gynecological Association; Honorary Chairman Surgical Section of the First Pan-American Medical Congress, and one of its Trustees; Founder of the Congress of American Physicians and Surgeons. 13 South Joachim Street, Mobile, Ala.

1891.—Moses, Gratz Ashe, M.D. Emeritus Professor of Obstetrics and Gynecology in the Missouri Medical College; formerly in charge of the Woman's Department, St. Louis Hospital, and Clinical Lecturer in Gynecology, St. Louis Medical College; Physician to Augusta Hospital. 3941 West Bell Place, St. Lous, Mo.

1889.—Nicolaysen, Julius, M.D. Professor of Surgery in the University of Norway. Christiania, Norway.

1891.—Pietranera, E., M.D. Professor of Obstetrics in the Medical Department of the National University; Director of the Maternity Branch of the Clinical Hospital. 2711 Calle Rio Adaria, Buenos Ayres, Argentine Republic, S. A.

1891.—Rodriquez, Juan M., M.D. Professor of Clinical Obstetrics in the Medical School of the University of Mexico. Mexico.

1889.—Sänger, Max, M.D. Professor of Obstetrics and Gynecology, University of Leipzig; late President of the Leipzig Obstetrical Society; Honorary Member of the Obstetrical Societies of Philadelphia and Chicago; Honorary Member of the Belgian Gynecological Society, Brussels; Honorary Member of the Gynecological Society, Kiew; Corresponding Member of the Medical Society of Christiania, Norway. 16 Lindenstrasse, Leipzig, Germany.

1894.—Slaviansky, Kronid, M.D. Ordinary Professor of the Obstetrical and Gynecological Clinic at the Imperial Medical Academy; Director of the Lying-in Hospital of Gavan at St. Petersburg; Corresponding Fellow of the Boston Gynecological Society. 24 Liteinaia Street, St. Petersburg, Russia.

1890.—Savage, Thomas, M.D., F.R.C.S. Eng. Surgeon to the Birmingham Hospital for Women. 33 Newhall Street, Birmingham, England.

1889.—Schultze, Bernhard Sigmund, M.D. Professor of Gyne-

cology; Director of the Lying-in Institute and of the Gynecological Clinic. 2 Sellierstrasse, Jena, Germany.

1896.—Segond, Paul, M.D. Professor of the Faculty of Medicine, Paris; Surgeon to the Sâlpetrière; Principal Physician to the Orleans Railroad. 11 Quay d'Orsay, Paris.

1888.—Smith, J. Greig, M.A., C.M.,M.B., F.R.S.E. Surgeon to the Bristol Royal Infirmary; Lecturer on Surgery, Bristol Medical School; late Examiner in Surgery, University of Aberdeen, Scotland. 16 Victoria Square, Clifton, Bristol, England.

1896.—Sternberg, George M., A.M., M.D., LL.D. Brigadier-General and Surgeon-General, U. S. Army. Washington, D. C.

1888.—Tait, Lawson, M.D., LL.D., F.R.C.S.E. Surgeon to the Birmingham and Midland Hospital for Women; Consulting Surgeon to the West Bromwich, the Southampton, and the Nottingham Hospitals for Women; Professor of Gynecology and Member of the Council in Queen's College; President of Mason's Science College; Ex-President of the British Gynecological Society; President of the Birmingham Medical Institute; Ex-President of the Birmingham and Midland Counties Branch of the British Medical Association; President of the Worcestershire and Herefordshire Branch of the British Medical Association and of the Midland Medical Society. 7 The Crescent, Birmingham, England.

1888.—Williams, John, Bart., M.D., F.R.C.P. 63 Brook Street, Grosvenor Square W., London, England.

1889.—v. Winckel, F., M.D. Professor of Gynecology and Director of the Royal Hospital for Women; Member of the Supreme Council and of the Faculty of Medicine in the University of Munich. 16a Sonnenstrasse, Munich, Germany.

Total, thirty-one Honorary Fellows.

CORRESPONDING FELLOWS.

1891.—Griffin, Herbert Spohn, B.A., M.D. Surgeon to Hamilton City Hospital; Examiner in Obstetrics, University of Toronto. 157 Main Street, Hamilton, Ontario, Canada.

1891.—Machell, Henry Thomas, M.D., L.R.C.P. Ed. Lecturer on Obstetrics, Woman's Medical College; Surgeon to St. John's Hospital for Women; Physician to Victoria Hospital for Sick Children and to Hillcrest Convalescent Home. 95 Bellevue Avenue, Toronto, Ontario, Canada.

Total, two Corresponding Fellows.

ORDINARY FELLOWS.

* Deceased.

1890.—Asdale, William James, M.D. Professor of Diseases of Women, Western Pennsylvania Medical College, Medical Department University of Western Pennsylvania. 2107 Penn Avenue, Pittsburg, Pa.

1895.—Bacon, Joseph Barnes, M.D. Professor of Rectal Diseases at the Post-Graduate Medical School; Instructor in Clinical Surgery in the Medical Department of Northwestern University. 4125 Drexel Boulevard, Chicago, Ill.

Founder.—Baker, Washington Hopkins, M.D. Senior Obstetrician to the Maternity Hospital; Physician to the German Hospital. 1610 Summer Street, Philadelphia, Pa.

1895.—Baldwin, James Fairchild, A.M., M.D. Chancellor of, and Professor of Surgical Gynecology in, the Ohio Medical University; Gynecologist at the Protestant Hospital. 112 North Fourth Street, Columbus, O.

Founder.—Banta, Rollin Ledrue, M.D. Professor of Materia Medica and Therapeutics in Niagara University Medical College; Consulting Obstetrician to the Sisters of Charity and Woman's Hospitals; President of the Buffalo Obstetrical Society, 1887–88. *Vice-President*, 1890. *Executive Council*, 1891. 358 South Division Street, Buffalo, N. Y.

1889.—Barrow, David, M.D. Member of the Southern Surgical and Gynecological Association. 196 East High Street, Lexington, Kentucky.

1890.—Bernardy, Eugene Prosper, M.D. 221 South Seventeenth Street, Philadelphia, Pa.

1892.—Blume, Frederick, M.D. Gynecologist to the Allegheny General Hospital and Pittsburg Free Dispensary; Obstetrician to the Roselia Maternity Hospital; Consulting Gynecologist to the Mercy Hospital; President of the Pittsburg Obstetrical Society, 1892. 118 Liberty Street, Allegheny, Pa.

1893.—Boise, Eugene, A.B., M.D. Gynecologist to St. Mark's Hospital. 23 North Lafayette Street, Grand Rapids, Mich.

1896.—Bosher, Lewis C., M.D. Professor of the Principles of Surgery and Clinical Lecturer on Genito-urinary Surgery, Medical College of Virginia ; Visiting Surgeon to the Old Dominion Hospital. 717 East Franklin Street, Richmond, Va.

Founder.—Boyd, James Peter, A.M., M.D. Professor of Obstetrics, Gynecology, and Diseases of Children in the Albany Medical College; Gynecologist to the Albany Hospital; Consulting Obstetric Surgeon to St. Peter's Hospital; Fellow of the British Gynecological Society. 152 Washington Avenue, Albany, N. Y.

1889.—Branham, Joseph H., M.D. Demonstrator of Anatomy in the College of Physicians and Surgeons ; Visiting Surgeon to Bayview Hospital. 538 North Arlington Avenue, Baltimore, Md.

1894.—Brown, John Young, Jr., M.D. Late First Assistant Physician in the Central Kentucky Asylum for the Insane. 507 North Spring Avenue, St. Louis, Mo.

1889.—*Burns, Bernard, M.D., Allegheny, Pa. 1892.

1891.—Cameron, Irving Heward, M.B. Professor of Clinical Surgery in the University of Toronto ; Surgeon to the Toronto General Hospital, to the Hospital for Sick Children, and to St. John's Hospital for Diseases of Women. 307 Sherbourne Street, Toronto, Ont., Canada.

1895.—Chase, Walter Benajah, M.D. Gynecologist to the Bushwick Hospital; Gynecologist at the Eastern District Dispensary and Hospital; Member of the Brooklyn Pathological Society; Permanent Member of the Medical Society of the State of New York; Ex-President of the Brooklyn Gynecological Society; Ex-President of the Medical Society of the County of Kings. 291 Hancock Street, Brooklyn, N. Y.

Founder.—Carstens, J. Henry, M.D. Professor of Obstretrics and Clinical Gynecology in the Detroit College of Medicine; Gynecologist to Harper Hospital; Attending Physician to the Woman's Hospital; Obstetrician to the House of Providence; President of the Detroit Gynecological Society, 1892. *Vice-President*, 1888–'89; *President*, 1895; *Executive Council*, 1896–'97. 620 Woodward Avenue, Detroit, Mich.

1895.—Cheesman, William Sanderson, A.M., M.D. Surgeon to the Auburn City Hospital; Permanent Member of the Medical Society of the State of New York; Fellow of the New York Academy of Medicine. 22 William Street, Auburn, N. Y.

Founder.—Clarke, Augustus Peck, A.M., M.D. Dean and Professor of Gynecology and Abdominal Surgery in the College of Physicians and Surgeons, Boston; Vice-President of the American Medical

Association, 1896; President of the Gynecological Society of Boston, 1891–'92; Vice-President of the Pan-American Medical Congress, 1893; Member of the Massachusetts Medical Society; Fellow of the American Academy of Medicine; Member of the American Public Health Association; Consulting Physician to the Middlesex Hospital and Dispensary. 825 Massachusetts Avenue, Cambridge, Mass.

1890.—*Coles, Walter, M.D. St. Louis, Mo. 1892.

1892.—Cordier, Albert Hawes, M.D. Lecturer on Abdominal Surgery in the Kansas City Medical College; First Vice-president of the Kansas State Medical Society, 1892; Corresponding Member of the Philadelphia Obstetrical Society; *Vice-president*, 1896. 310 Rialto Building, Kansas City, Mo.

1894.—Crofford, Thomas Jefferson, M.D. Professor of Physiology and Clinical Lecturer on Diseases of Women in the Memphis Hospital Medical College; Member of the Southern Surgical and Gynecological Association. 155 Third Street, Memphis, Tenn.

Founder.—Cushing, Clinton, M.D. Professor of Gynecology in the Cooper Medical College; Consulting Surgeon to the French Hospital. *Executive Council*, 1888–'91. 636 Sutter Street, San Francisco, Cal.

1892.—Cushing, Ernest Watson, A.B., M.D. Surgeon of the Woman's Charity Club Hospital; Editor of the *Annals of Gynecology and Pediatry*. 168 Newbury Street, Boston, Mass.

1894.—Davega, S. M., M.D. Surgeon to the Richmond and Danville Railroad, C. and L. R. R., C. and C. R. R., G. C. and N. R. R. Wylie Street, Chester, S. C.

1889.—Davis, William Elias B., M.D. Profesor of Gynecology and Abdominal Surgery in the Birmingham Medical College; Secretary of the Southern Surgical and Gynecological Association, 1888–'97; formerly Surgeon to the Birmingham Hospital of United Charities; President of the Tri-state Medical Society of Alabama, Georgia, and Tennessee, 1892; Secretary of the Surgical Section of the American Medical Association, 1891; Honorary President of the Section on Gynecology and Abdominal Surgery of the First Pan-American Medical Congress: Honorary Member of the Medical Society of the State of New York; *Vice-President*, 1895. *Executive Council*, 1897. 2031 Avenue G, Birmingham, Ala.

1896.—Deaver, John Blair, M.D. Assistant Professor of Applied Anatomy at the University of Pennsylvania; Visiting Surgeon to the German Hospital. 1634 Walnut Street, Philadelphia, Pa.

1892.—Dewees, William Busby, A.M., M.D. President, 1891–'92, of the Golden Belt Medical Society of Kansas; Vice-President of the

Pan-American Medical Congress of 1893 for Kansas; Fellow of the American Academy of Medicine; Member of the American Public Health Association; Member of the American Medical Association; Member of the Western Association of Obstetricians and Gynecologists; Member of the Kansas State Medical Society; Life Member of the International Periodical Congress of Gynecology and Obstetrics. N. W. corner Santa Fé and Prescott Avenues, Salina, Kansas.

1892.—Dorsett, Walter Blackburn, M.D. Professor of Obstetrics in the Beaumont Hospital Medical College; President of the St. Louis Medical Society, 1892. 3941 West Bell Place, St. Louis, Mo.

1889.—Douglas, Richard, M.D. Professor of Gynecology and Abdominal Surgery in the Vanderbilt Medical College; President of the Tri-state Medical Society of Alabama, Georgia, and Tennessee, 1893; Fellow of the British Gynecological Society; Member of the Southern Surgical and Gynecological Association. 110 Spruce Street, Nashville, Tenn.

1892.—Duff, John Milton, A.M., M.D., Ph.D. Chairman of the Section of Obstetrics and Diseases of Women in the American Medical Association, 1893: Professor of Obstetrics in the Western Pennsylvania Medical College; Surgeon and Gynecologist to the Pittsburg South Side Hospital; Fellow of the American Academy of Medicine; President of the Pittsburg Obstetrical Society, 1891. 2006 Carson Street, Pittsburg, Pa.

1894.—Dunlap, Fayette, A.B., M.D. Danville, Ky.

1895.—Dunn, James Henry, M.D. Professor of Genito-urinary Diseases and Adjunct Professor of Clinical Surgery at the Medical Department of the University of Minnesota; Surgeon to City, Asbury, and St. Mary's Hospitals. 104 Royalston Avenue, Minneapolis, Minn.

1895.—Dunn, B. Sherwood, M.D. 946 Broadway, Los Angeles, Cal.

1892.—Dunning, Lehman Herbert, M.D. Professor of Diseases of Women in the Medical College of Indiana; Consulting Gynecologist to the Indianapolis City Hospital and Dispensary. 249 North Alabama Street, Indianapolis, Ind.

1895.—Earle, Frank Breckenridge, M.D. Professor of Obstetrics at the College of Physicians and Surgeons. 535 Washington Boulevard, Chicago, Ill.

1895.—Ferguson, Alexander Hugh, M.D. Professor of Surgery at the Chicago Post-Graduate Medical School. 2950 Indiana Avenue, Chicago, Ill.

1895.—Fish, Edmund Frost, M.D. Professor of Gynecology in the Milwaukee Medical College; Gynecologist to the Trinity, St. Joseph's, and Milwaukee City Hospitals; Gynecologist to the Milwaukee Free Dispensary. 211 Grand Avenue, Milwaukee, Wis.

1890.—Frederick, Carlton Cassius, B.S., M.D. Adjunct Professor of Obstetrics in the Medical Department of Niagara University; Obstetrician and Gynecologist to the Buffalo Woman's Hospital; Obstetrician to the Widows' and Infants' Asylum; Gynecologist to the Erie County Hospital. 64 Richmond Avenue, Buffalo, N. Y.

1891.—Gibbons, Henry, Jr., A.M., M.D. Dean and Professor of Obstetrics and Diseases of Women and Children in Cooper Medical College; Consulting Physician to the French and the Children's Hospitals. 920 Polk Street, San Francisco, Cal.

1895.—Gilliam, David Tod, M.D. Professor of Obstetrics and Gynecology in the Starling Medical College. 70 Winner Avenue, Columbus, O.

1895.—Goldspohn, Albert, B.S., M.D. Professor of Gynecology at the Post-Graduate Medical School; Attending Gynecological Surgeon to the German, Post-Graduate, and Deaconess's Hospitals. 519 Cleveland Avenue, Chicago, Ill.

1894.—Griffith, Jefferson Davis, M.D. Professor of Surgery in the Kansas City Medical College; Surgeon to St. Joseph's Hospital and to the Children's Hospital. Corner Grand Avenue and Thirty-fifth Street, Kansas City, Mo.

1892.—Haggard, William David, M.D. Professor of Gynecology and Diseases of Children in the Medical Department of the University of Tennessee; Consulting Gynecologist to City Hospital; Gynecologist to St. Margaret's Hospital; Chairman of Section on Diseases of Children, American Medical Association, 1886; Fellow (President, 1888) of the Southern Surgical and Gynecological Association; President of the Nashville Academy of Medicine and Surgery. 312 North High Street, Nashville Tenn.

1889.—Hall, Rufus Bartlett, M.D. Didactic and Clinical Lecturer on Gynecology in the Miami Medical College; Surgeon-in-Charge of the Abdominal Department of the Presbyterian Hospital; Member of the Southern Surgical and Gynecological Association. *Vice-President*, 1891. Berkshire Building, 250 Elm Street, Cincinnati, Ohio.

1894.—Hayd, Herman Emilie, M.D., M.R.C.S., Eng. Gynecologist to the Erie County Hospital. 78 Niagara Street, Buffalo, N. Y.

1891.—Haynes, John Rudolph, M.D., Ph.D. Associate Professor of Gynecology in the Medical College of the University of Southern California. 929 South Main Street, Los Angeles, Cal.

Founder.—*Hill, Hampton Eugene, M.D. 1894.

1889.—Hoffman, Joseph, B.A., M.D. 124 West Diamond Street, Philadelphia, Pa.

1891.—Holmes, Josus Billington Sanders, M.D. Professor of Obstetrics in the Southern Medical College; President of the Georgia State Medical Association, 1890; Member of the Southern Surgical and Gynecological Association; Member of the American Medical Association. 17 West Cain Street, Atlanta, Georgia.

1894.—Howell, Stephen Yates, A.M., M.D., M.R.C.S. Eng. Clinical Instructor in Diseases of Women in the Medical Department of the University of Buffalo; Gynecologist to the Erie County Hospital. 164 Franklin Street, Buffalo, N. Y.

1891.—Howitt, Henry, M.D., M.R.C.S. Eng. Surgeon to the Guelph General and St. Joseph's Hospitals, Guelph; Member of the British and Ontario Medical Associations; Medical Health Officer for the City of Guelph. *Vice-President*, 1895. 235 Woolwich Street, Guelph, Ontario, Canada.

1890.—Hughes, Donnel, M.D. *Executive Council*, 1893. 4005 Chestnut Street, Philadelphia, Pa.

1896.—Hughes, George Maurice, M.D. Physician in Charge of the Obstetric and Gynecological Department of the Philadelphia Dispensary. 241 North Eighteenth Street, Philadelphia, Pa.

1892.—Hulbert, George Frederick, M.D. Professor of the Principles and Practice of Medicine and Clinical Gynecology in the Marion-Sims Medical College; Consulting Physician and Surgeon to the Missouri Pacific Railway Hospital; Consulting Gynecologist to the St. Louis City and Female Hospitals; Secretary of the St. Louis Obstetrical and Gynecological Society. *Vice-President*, 1894. 4270 Delmar Avenue, St. Louis, Mo.

1895.—Humiston, William Henry, M.D. Clinical Lecturer on Gynecology at the Medical Department of the Western Reserve University; Consulting Gynecologist to the City Hospital. 122 Euclid Avenue, Cleveland, O.

1892.—Hypes, Benjamin Murray, A.M., M.D. Professor of Obstetrics in the Marion-Sims Medical College. 2005 Victor Street, St. Louis, Mo.

Founder.—Ill, Edward Joseph, M.D. Surgeon to the Woman's Hospital; Gynecologist to St. Barnabas's and Consulting Gynecologist

to the German Hospitals. *Vice-President*, 1893. 1002 Broad Street, Newark, N. J.

1894.—Jayne, Walter Addison, M.D. Lecturer on Gynecology in the Medical Department of the University of Colorado; Consultant in Gynecology, St. Luke's Hospital; Gynecologist to the Arapahoe County Hospital, Denver. 217 McPhee Building, Denver, Col.

Founder.—Jarvis, George Cyprian, M.D. Visiting Surgeon to the Hartford Hospital. 98 High Street, Hartford, Conn.

1892.—Jelks, James Thomas, M.D. President of the Arkansas Medical Society, 1892; Chairman of the Section of Surgery in the American Medical Association, 1893; Professor of Gynecology in Barnes Medical College, St. Louis, Mo.; Member of the Southern Surgical and Gynecological Association. 178 Central Avenue, Hot Springs, Ark.

1894.—Jennings, Charles Godwin, M.D. Professor of the Theory and Practice of Medicine and Clinical Diseases of Children in the Detroit College of Medicine; Physician to St. Mary's Hospital, Department of Diseases of Children; Physician to St. Vincent's Orphan Asylum; Consulting Physician to the Woman's Hospital and Foundlings' Home; Consulting Physician to St. Luke's Hospital; Member of the American Pediatric Society. 457 Jefferson Avenue, Detroit, Mich.

1891.—Johnston, George Ben, M.D. Professor of Surgery in the Medical College of Virginia; Physician to St. Sophia's Home for the Aged; Physician to St. Joseph's Female Orphan Asylum; Consulting Surgeon to the Richmond Eye, Ear, and Throat Infirmary; Vice-president of the Southern Surgical and Gynecological Association, 1892; President, 1897; Ex-President of the Richmond Medical and Surgical Society. *Vice-President*, 1897. 407 East Grace Street, Richmond, Va.

1893.—Laidley, Leonidas Hamlin, M.D. Professor of Gynecology in the Beaumont Hospital Medical College; Surgeon-in-Chief to the Protestant Hospital. 3538 Washington Avenue, St. Louis, Mo.

1890.—Longyear, Howard Williams, M.D. Gynecologist to Harper Hospital; Physician to the Women's Hospital; President of the Detroit Gynecological Society, 1889; Chairman of the Section on Obstetrics and Gynecology of the Michigan State Medical Society, 1892. *Vice President*, 1893. 698 Woodward Avenue, Detroit, Mich.

Founder.—Lothrop, Thomas, M.D. Professor of Obstetrics, Niagara University; Director of the Woman's Hospital; Physician

to St. Francis's Hospital; Consulting Physician to the Hospital of the Sisters of Charity and to the Providence Retreat for the Insane. 153 Delaware Avenue, Buffalo, N. Y.

1896.—Lyons, John Alexander, M.D. Instructor in Gynecology at the Post-Graduate Medical School; Gynecologist and Lecturer to Nurses at the Chicago Hospital. 4118 State Street, Chicago, Ill.

1891.—Macdonald, Willis Goss, M.D. Lecturer on Operative Surgery and Instructor in Abdominal Surgery in Albany Medical College; Surgeon to the Out-door Department of the Albany Hospital. 27 Eagle Street, Albany, N. Y.

Founder.—McArdle, Thomas Eugene, A.M., M.D. Professor of Minor Surgery in the National Medical College; Assistant Surgeon in the Children's Hospital. 821 Sixteenth Street, Washington, D. C.

1891.—*McCann, James, M.D. Pittsburg, Pa. 1893.

1893.—McColl, Hugh, M.D. Graduate Toronto Normal, 1864; Bellevue Hospital Medical College, N. Y., 1871; Member of the American Medical Association; Member of the American Health Association; Member of the American Academy of Political and Social Science; Member of the Michigan State Medical Society; Member of the Detroit Gynecological Society; Member of the Michigan N. E. District Medical Association. Nepessing Street, Lapeer, Mich.

1894.—McGuire, Edward, M.D. Professor of Gynecology in the University College of Medicine; Gynecologist to the Virginia Hospital; Member of the Southern Surgical and Gynecological Association. 216 East Franklin Street, Richmond, Va.

Founder.—McMurtry, Lewis Samuel, A.M., M.D. Professor of Gynecology in the Hospital College of Medicine; Gynecologist to Sts. Mary and Elizabeth Hospital; Fellow of the Edinburgh Obstetrical Society; Fellow of the British Gynecological Society; Corresponding Member of the Obstetrical Society of Philadelphia and of the Gynecological Society of Boston; Member (President, 1891) of the Southern Surgical and Gynecological Association. *Executive Council*, 1891–'92, 1895–97; *President*, 1893. 231 West Chestnut Street, Louisville, Ky.

Founder.—Manton, Walter Porter, M.D. Professor of the Detroit Academy of Medicine, 1894; Vice-President of the Medical Board of the Woman's Hospital and Foundlings' Home; Consulting Gynecologist to the Eastern and Northern Michigan State Asylum for the Insane and St. Joseph's Retreat; Gynecic Surgeon to the House of the Good Shepherd; Lecturer on Obstetrics in the Detroit Medical College; Fellow of the British Gynecological Society; Fellow of the

Royal Microsopical Society. *Vice-President,* 1894. 32 Adams Avenue, Detroit, Michigan.

Founder.—Maxwell, Thomas Jefferson, M.D. Professor of Obstetrics and Gynecology, College of Physicians and Surgeons; Surgeon to St. Joseph's Hospital. 727 North Ninth Street, Keokuk, Iowa.

1893.—*Michael, Jacob Edwin, A.M., M.D., 1895. Baltimore, Maryland.

Founder.—Miller, Aaron Benjamin, M.D. Professor of Gynecology in the Medical Department of Syracuse University; Gynecologist to St. Joseph's Hospital, House of the Good Shepherd and Dispensary. 326 Montgomery Street, Syracuse, N. Y.

1896.—Mooney, Fletcher D., M.D. 3035 Washington Avenue, St. Louis, Mo.

1890.—Morris, Robert Tuttle, A.M., M.D. Instructor in Surgery in the New York Post-Graduate Medical School and Hospital. *Vice-President,* 1892. 49 West Thirty-ninth Street, New York, N. Y.

Founder.—Moses, Gratz Ashe, M.D. (See Honorary Fellows.)

1894.—Murphy, John Benjamin, A.M., M.D. Professor of Surgery in the College of Physicians and Surgeons and in the Post-Graduate Medical College; Attending Surgeon to the Cook County Hospital and to Alexander Hospital. Residence, 3152 Michigan Avenue; Office, 34 Venetian Building, Chicago, Ill.

Founder.—Myers, William Herschel, M.D. Surgeon to St. Joseph's Hospital; Member of the American and the British Medical Associations; Member of the Pathological Society of London; Member of the International Congress of Gynecologists and Obstetricians; Member of the Chicago Medical Society. *Vice-President,* 1890. 157 West Wayne Street, Fort Wayne, Indiana.

1891.—Nevitt, R. Barrington, B.A., M.D. Lecturer on Clinical Surgery and Dean of the Women's Medical College; Surgeon to Toronto General Hospital; Surgeon to the Hospital for Sick Children; Surgeon to St. Michael's Hospital. 176 Jarvis Street, Toronto, Ont., Canada.

1896.—Noble, George Henry, M.D. Gynecologist to the Grady Hospital; Secretary of the Section of Obstetrics and Gynecology, American Medical Association, 1897; Member of the Southern Surgical and Gynecological Association. 186 South Pryor Street, Atlanta, Ga.

1889.—Paine, John Fannin Young, M.D. Professor of Obstetrics and Gynecology in the School of Medicine, University of Texas;

Obstetrician and Gynecologist to the John Sealy Hospital; President of the Texas State Medical Association, 1888; Vice-president of the Section of Public and International Hygiene in the Ninth International Medical Congress; Member of the American Medical Association and of the Southern Surgical and Gynecological Association. S. E. corner Broadway and Twenty-sixth Street, Galveston, Texas.

1890.—Pearson, William Libbey, M.D. 713 Union Street, Schenectady, N. Y.

1891.—Peck, George Sherman, M.D. Consulting Surgeon to the City Hospital. *Vice-President*, 1896. 26 West Federal Street, Youngstown, Ohio.

1893.—Peterson, Reuben, A.B., M.D. Gynecologist to St. Mark's Hospital. 26 South Union Street, Grand Rapids, Mich.

1891.—Porter, William, Jr., M.D. Attending Physician to the Hartford Orphan Asylum; Member of the Hartford Medical Society, of the Hartford County Medical Society, and of the Connecticut State Medical Society. 47 Forest Street, Hartford, Conn.

Founder.—Potter, William Warren, M.D. Consulting Gynecologist to the Woman's Hospital; Examiner in Obstetrics, New York State Medical Examining and Licensing Board; Chairman of the Section of Obstetrics and Diseases of Women, American Medical Association, 1890; President of the Buffalo Obstetrical Society, 1884–'86; Member of the Southern Surgical and Gynecological Association; President of the Medical Society of the State of New York, 1891; Executive President of the Section of Gynecology and Abdominal Surgery, Pan-American Medical Congress, 1893. *Secretary*, 1888–'97. 284 Franklin Street, Buffalo, N. Y.

1891.—Praeger, E. Arnold, M.D. Professor of Gynecology at the Los Angeles Polyclinic; Clinical Gynecologist at the Free Dispensary; Fellow of the Obstetrical Society of London, England; Member of the British and Canadian Medical Associations; Member of the Southern California and Los Angeles County Medical Societies. 57–59 Potomac Block, Broadway, Los Angeles, Cal.

Founder.—Price, Joseph, M.D. Physician-in-charge of the Obstetrical and Gynecological Department of the Philadelphia Dispensary; Member of the Southern Surgical and Gynecological Association; Honorary Fellow of the Medical Society of the State of New York; Honorary Fellow of the South Carolina Medical Society; Honorary Fellow of the Virginia Medical Society; Member of the British Gynecological Association and of the Edinburgh Obstetrical Society. *Executive Council*, 1894–'95. *President*, 1896. 241 North Eighteenth Street, Philadelphia, Pa.

Founder.—Reed, Charles Alfred Lee, A.M., M.D. Professor of Gynecology and Abdominal Surgery in the Cincinnati College of Medicine and Surgery and in the Woman's Medical College of Cincinnati; Surgeon to the Cincinnati Free Surgical Hospital for Women; Secretary-General of the First Pan-American Medical Congress, 1893; Member of the Southern Surgical and Gynecological Association. *Executive Council*, 1890–'97. St. Leger Place, Cincinnati, Ohio.

1896.—Rhett, Robert Barnwell, Jr., M.D. Dean and Professor of Gynecology and Abdominal Surgery at the Charleston Medical School; Gynecologist to St. Francis Xavier's Infirmary; Surgeon to the City Hospital. 109 Cannon Street, Charleston, S. C.

1890.—Ricketts, Edwin, M.D. Professor of Abdominal Surgery and Gynecology at the Cincinnati Polyclinic; Member of the American and British Medical Associations; Member of the Southern Surgical and Gynecological Association. 415 Broadway, Cincinnati, Ohio.

1890.—Robinson, William Lovaille, M.D. Ex-President of the Danville Medical Society; Member of the Virginia State Medical Examining Board; Member of the Southern Surgical and Gynecological Association. 733 Main Street, Danville, Va.

1889.—Rohé, George Henry, M.D. Professor of Materia Medica, Hygiene, and Mental Diseases in the College of Physicians and Surgeons; Superintendent of the Maryland Hospital for the Insane; Member of the Southern Surgical and Gynecological Association; *Vice-President*, 1891. *Executive Council*, 1892–'93. *President*, 1894. Sykesville, Md.

1892.—Rosenwasser, Marcus, M.D. Dean and Professor of Diseases of Women and Abdominal Surgery in the University of Wooster; Gynecologist to the Cleveland Hospital for Women and Children; Consulting Gynecologist to the City Hospital; Member of the American Medical and Ohio State Medical Associations. 722 Woodland Avenue, Cleveland, Ohio.

1890.—Ross, James Frederick William, M.D., L.R.C.P. (Eng.). Gynecologist to the Toronto General Hospital; Surgeon to the Woman's Hospital; Lecturer in Clinical Gynecology at the University of Toronto. *Executive Council*, 1892–'96. *President*, 1897. 481 Sherburne Street, Toronto, Ont., Canada.

1895.—Sellman, William Alfred Belt, M.D. Professor of the Diseases of Women and Obstetrics at the Baltimore University School of Medicine. 5 East Biddle Street, Baltimore, Md.

1890.—Sexton, John Chase, A.M., M.D. *Executive Council*, 1894; *Vice-President*, 1897. Rushville, Indiana.

1889.—Seymour, William Wotkyns, A.B., M.D. Professor of Gynecology in the University of Vermont; formerly House Surgeon of the Boston City Hospital; Member of the American Medical Association; Fellow of the New York State Medical Association; Member of the British Medical Association. *Executive Council*, 1892–'93. 105 Third Street, Troy, N. Y.

1891.—Smith, Charles North, M.D. Professor of Obstetrics and Clinical Gynecology in the Toledo Medical College; Gynecologist to St. Vincent's Hospital. 1921 Franklin Avenue, Toledo, Ohio.

1895.—Steele, Daniel Atkinson King, M.D. President and Professor of the Principles and Practice of Surgery at the College of Physicians and Surgeons; Attending Surgeon at the Chicago, Wesley, and Post-Graduate Hospitals; Consulting Surgeon at the Palmer Memorial Hospital, Janesville, Wis. 2920 Indiana Avenue, Chicago, Ill.

1890.—Stone, Isaac Scott, M.D. Professor of Clinical Gynecology in the University of Georgetown; Gynecologist to the Columbia Hospital for Women; Fellow of the British Gynecological Society; Member of the Southern Surgical and Gynecological Association; Member of the Medical Society of the District of Columbia. 1409 Rhode Island Avenue, N. W., Washington, D. C.

Founder.—Storrs, Melancthon, A.M., M.D. Attending Surgeon to the Hartford Hospital; President Connecticut State Medical Society. *Executive Council*, 1888–'89. 91 Ann Street, Hartford, Conn.

1894.—Stover, Charles, M.D. President of the Amsterdam City Medical Society, 1895. 31 Division Street, Amsterdam, N. Y.

1894.—Tappey, Ernest Taylor, A.M., M.D. Clinical Professor of Surgery in the Detroit College of Medicine; Surgeon to Harper Hospital. 141 Fort Street, Detroit, Mich.

1894.—Taylor, Hugh McGuire, M.D. Professor of the Practice of Surgery in the University College of Medicine, Richmond, Va.; Member of the Surgical Staff of the Virginia Hospital, Richmond, Va.; Ex-President of the Medical Examining Board of Virginia; Ex-President of the Richmond Medical and Surgical Society; Member of the American Medical Association; Member of the Southern Surgical and Gynecological Association; Member of the National Association of Railway Surgeons. 6 North Fifth Street, Richmond, Va.

Founder.—Taylor, William Henry, M.D., Ph.D. Dean and Professor of Obstetrics, Miami Medical College; Obstetrician to the Cincinnati Hospital; Consulting Obstetrician to Christ's Hospital. *President*, 1888–'89. 553 West Seventh Street, Cincinnati, Ohio.

1890.—Thomas, George Gillett, M.D. Ex-President Medical Society of the State of North Carolina. Wilmington, N. C.

1895.—Thompson, Frank Daniel, M.D. Professor of Gynecology in the Medical Department of Fort Worth University. 412 Adams Street, Fort Worth, Texas.

1895.—Tompkins, Christopher, M.D., Ph.D. Professor of Obstetrics and Dean of the Medical College of Virginia; Obstetrician to the Old Dominion Hospital; Member of the Southern Surgical and Gynecological Association. 116 East Franklin Street, Richmond, Va.

Founder.—*Townsend, Franklin, A.M., M.D., 1895. Albany, N. Y.

Founder.—Vander Veer, Albert, A.M., M.D., Ph.D. Professor of Didactic, Clinical, and Abdominal Surgery in the Albany Medical College; Attending Surgeon to the Albany Hospital; Consulting Surgeon to St. Peter's Hospital; Fellow of the American Surgical Association; Fellow of the British Gynecological Society; Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Boston Gynecological Society. *Executive Council* 1889–'91, 1895–'97; *President*, 1892. 28 Eagle Street, Albany, N. Y

1891.—Walker, Edwin, M.D., Ph.D. Gynecologist to the Evansville City Hospital; President of the Indiana State Medical Society, 1892; Member of the American Medical Association; and of the Mississippi Valley Medical Association; Member of the Southern Surgical and Gynecological Association. 427 Upper Third Street, Evansville, Indiana.

1890.—Ward, Milo Buel, A.M., M.D. Professor of Gynecology in the Kansas Medical College; Secretary of the Section on Obstetrics and Diseases of Women in the American Medical Association, 1893; President of the Western Association of Obstetricians and Gynecologists, 1892. 323 Potwin Place, Topeka, Kansas.

1889.—Wenning, William Henry, A.M., M.D. Professor of Obstetrics in the Woman's Medical College; Gynecologist to St. Mary's Hospital. 722 Laurel Street, Cincinnati, Ohio.

Founder.—Werder, Xavier Oswald, M.D. Professor of Gynecology at the Western Pennsylvania Medical College (Medical Department, University of Western Pennsyluania); Consulting Gynecologist at the Allegheny General Hospital; Gynecologist to the Mercy Hospital and Pittsburg Free Dispensary; Obstetrician to the Roselia Maternity Hospital; Consulting Gynecologist to St. Francis's Hospital; Consulting Surgeon to the South Side Hospital. *Treasurer*, 1888–'97. 524 Penn Avenue, Pittsburg, Pa.

1896.—Westmoreland, Willis Foreman, M.D. Professor of Surgery at the Atlanta Medical College. Equitable Building, Atlanta, Ga.

1893.—Wheaton, Charles Augustus, M.D. Professor of Clinical Surgery in the University of Minnesota. 301 Summit Avenue, St. Paul, Minn.

1893.—Winn, John Farmer, M.D. Adjunct Professor of Obstetrics in the College of Physicians and Surgeons, Richmond, Virginia; Corresponding Secretary of the Medical Society of Virginia; Member of the Richmond Academy of Medicine and Surgery; Editor and Proprietor of *Richmond Journal of Practice.* 800 East Marshall Street, Richmond, Virginia.

Founder.—Wright, Adam Henry, B.A., M.D. Univ. Toronto, M.R.C.S. Eng. Professor of Obstetrics in the University of Toronto; Obstetrician and Gynecologist to the Toronto General Hospital and Burnside Lying-in Hospital. *President,* 1891. 30 Gerrard Street, East, Toronto, Ont., Canada.

Total, one hundred and sixteen Ordinary Fellows.

MINUTES OF THE PROCEEDINGS

AT THE

NINTH ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS,

HELD IN THE

ASSEMBLY HALL OF THE JEFFERSON HOTEL,

Richmond, Va.,

SEPTEMBER 22, 23, AND 24, 1896.

NINTH ANNUAL MEETING.

RICHMOND, VIRGINIA, TUESDAY, WEDNESDAY, AND THURSDAY,
SEPTEMBER 22, 23, AND 24, 1896.

The following-named Fellows were present:

BALDWIN, JAMES F.	COLUMBUS.
BOSHER, LEWIS C.	RICHMOND.
BRANHAM, JOSEPH H.	BALTIMORE.
CARSTENS, J. HENRY	DETROIT.
CHASE, WALTER B.	BROOKLYN.
CORDIER, A. H.	KANSAS CITY.
DAVIS, WM. E. B.	BIRMINGHAM.
DORSETT, WALTER B.	ST. LOUIS.
DUFF, JOHN M.	PITTSBURG.
DUNNING, L. H.	INDIANAPOLIS.
FISH, EDMUND F.	MILWAUKEE.
GASTON, J. McFADDEN	ATLANTA.
GILLIAM, D. TOD	COLUMBUS.
GOLDSPOHN, ALBERT	CHICAGO.
HALL, RUFUS B.	CINCINNATI.
HOFFMAN, JOSEPH	PHILADELPHIA.
HUGHES, GEO. M.	PHILADELPHIA.
HYPES, BENJAMIN M.	ST. LOUIS.
ILL, EDWARD J.	NEWARK.
JOHNSTON, GEO. BEN	RICHMOND.
LONG, JOHN W.	RICHMOND.
LONGYEAR, HOWARD W.	DETROIT.
MACDONALD, WILLIS G.	ALBANY.
MANTON, WALTER P.	DETROIT.
McARDLE, THOMAS E.	WASHINGTON.
McGUIRE, EDWARD	RICHMOND.
McMURTRY, LEWIS S.	LOUISVILLE.
MILLER, AARON B.	SYRACUSE.
MURPHY, JOHN B.	CHICAGO.
MYERS, WM. H.	FORT WAYNE.
NOBLE, GEORGE H.	ATLANTA.
POTTER, WILLIAM W.	BUFFALO.
PRICE, JOSEPH	PHILADELPHIA.

RHETT, R. B., Jr.	Charleston.
REED, CHARLES A. L.	Cincinnati.
RICKETTS, EDWIN	Cincinnati.
ROHÉ, GEORGE H.	Sykesville.
STONE, ISAAC S.	Washington.
STOVER, CHARLES	Amsterdam.
TAYLOR, HUGH M.	Richmond.
TOMPKINS, CHRISTOPHER	Richmond.
THOMPSON, FRANK D.	Fort Worth.
WINN, JOHN F.	Richmond.

Total, forty-three Fellows.

Letters or messages of regret were received from the following-named Fellows:

Honorary.—A. H. Freeland Barbour, A. Cordes, A. Fr. Eklund, Traill Green, A. Martin, Claudius H. Masten, Donald Maclean, and Lawson Tait.

Ordinary.—David Barrow, Eugene Boise, James P. Boyd, William S. Cheesman, Clinton Cushing, William B. Dewees, B. Sherwood Dunn, Frank B. Earle, Alexander H. Ferguson, C. C. Frederick, J. D. Griffith, H. E. Hayd, J. B. S. Holmes, Stephen Y. Howell, Donnel Hughes, Walter A. Jayne, James T. Jelks, L. H. Laidley, Hugh McColl, George S. Peck, E. Arnold Praeger, M. Rosenwasser, James F. W. Ross, John C. Sexton, William Wotkyns Seymour, D. A. K. Steele, Ernest T. Tappey, George G. Thomas, A. Vander Veer, William H. Wenning, X. O. Werder, and A. H. Wright.

Upon recommendation of the Executive Council the following-named physicians were invited to participate in the proceedings as members by invitation:

J. Wesley Bovee, Washington; F. D. Bittinger, Dayton, Ohio; Bedford Brown, Alexandria; C. G. Cannady, Roanoke; Joseph Charles, Newport News; Thomas B. Eastman, Indianapolis; R. H. Gibbons, New York; Samuel Lile and R. W. Martin, Lynchburg; James F. Lynch, Norfolk; George H. Lee, Galveston; Ernest S. Lewis, New Orleans; A. H. Meisenbach, St. Louis; R. Morton Smith, River Point, R. I.; E. R. Turnbull, Lawrenceville, Va.; James Lorrimer, Glen Island, Va.; and C. W. P. Brock, Charles B. Brock, Walter D. Burfort, G. W. Carrington, O. A. Crenshaw, William V. Croxton, Charles R. Cullen, J. Sells Daniel, H. W. Davis, Philip P. Duval, Landon B. Edwards, William F. Farrar, James F. Garlick, William S. Gordon, Benjamin Harrison, J. Allison Hodges, Paulus A. Irving, Martin L. James, Aaron Jeffery, James C. Jordan, W. A. Lee, J. G. Lumpkin,

James B. McCaw, Hunter McGuire, Stuart McGuire, E. W. Morehouse, William W. Parker, Charles R. Robins, George Ross, John G. Trevillian, John N. Upshur, John S. Wellford, Joseph A. White, of Richmond.

First Day—*Tuesday, September 22d.*

Morning Session.—The Association met in the assembly hall of the Jefferson Hotel, and was called to order at 9.50 o'clock by the President, Dr. Joseph Price, of Philadelphia.

Dr. James B. McCaw, of Richmond, was introduced, and delivered the following

ADDRESS OF WELCOME.

Mr. President and Fellows of the American Association of Obstetricians and Gynecologists: I am here this morning to tender you, on behalf of the medical profession of Richmond, a most hearty welcome to this the capital city of the Old Dominion. I think a pilgrimage to this place is especially appropriate for men of your position in our profession. You must recollect that the standard of medicine was first elevated in this Commonwealth at the same time freedom was obtained. John Smith brought out the first regular-bred physician to arrive on this soil. His name was Russell, and we know little of him except that he was a man of note, because Smith named one of the islands in the Chesapeake Bay after Russell. There was another Englishman, whose name I cannot recall, who came to this State, these being the first two physicians in the country. Now we have hundreds of medical colleges, medical journals, hospitals, sanitariums, and, above all, a most magnificent profession that is ever progressing; and all this has transpired in less than three hundred years. A pilgrimage to a section like this will do you good. It will be the means of deciding some difficult points in medicine. In paying us this short visit, our only wish is that it could be longer. We hope while you are here you will enjoy yourselves, that your deliberations will be very instructive, and that when you go away you will say, "It was good for us to have been here." (Applause.)

RESPONSE BY THE PRESIDENT.

Dr. McCaw: There can be no question as to the genuineness, the heartiness of the welcome extended to us. We realize that we are generously tendered the hospitality of the capital city of a great Commonwealth, one which has produced able medical teachers and practi-

tioners, the native State of Burnham and Ephraim McDowell, the pioneers in those departments of surgical science which it is the purpose and endeavor of this Association to promote. These early Virginia workers enriched our science and art, not so much by what they wrote or said as by doing successfully that which never before had been done. For more than three-quarters of a century we have been following the lessons they taught us. We are here to measure to what extent we have advanced, with what zeal, energy, and ability we have used our better life and opportunities and the teachings of our wider experience in perfecting the methods of dealing with certain human maladies which they transmitted to us.

While we are here for work we will participate in and enjoy at the same time kindly, social fellowship. All science, all talk of disease would be dreary work. So we will enjoy in the recesses from our labors all the forms of your cordial greetings. We knew in what city we were to meet, of the repute for refined hospitality which generations of cultured ancestry had left as a cherished legacy. These forefathers lived and taught wisely who practised and transmitted to us the spirit of those sweet amenities which give cheer and life. We are the grateful recipients of that unstudied courtesy of the South which is traditional, and which alone of all traits distinguishes the true gentleman of your section wherever he may be.

The eminent German Goethe did not give utterance to a meaningless and empty platitude when he said, "Kindness is the golden chain by which society is bound together." We further interpret your welcome as expressing an appreciation kindred to our own, of the worthy object for which we meet; it deepens the sense of our responsibility. On behalf of the Association I thank you. (Applause.)

On motion of Dr. Potter, Dr. Ernest S. Lewis, of New Orleans, President of the Southern Surgical Association, Dr. James McFadden Gaston and Dr. Bedford Brown, of Alexandria, ex-Presidents of the Southern Surgical Association, were accorded the privileges of the platform.

Papers were then read as follows:

1. "Pelvic Diseases and their Causes," by Dr. John M. Duff, of Pittsburg, Pa.

2. "Deceptive Signs and Symptoms in Intra-abdominal Disease, with Cases," by Dr. Walter B. Dorsett, of St. Louis, Mo.

3. "What are the Most Potent Causes of Pelvic Inflammation?" by Dr. Rufus B. Hall, of Cincinnati, O.

The foregoing papers were then discussed jointly by Drs. Carstens, Davis, Gaston, Lewis (by invitation), Thompson, McMurtry, Dunning,

Cordier, Ricketts, Fish, Gibbons (by invitation), Longyear, and the discussion was closed by the authors.

Dr. George Ben Johnston reported a case of ovarian tumor, the first done under Listerism in Virginia, presenting the patient; and one of unilocular cyst.

4. "Mixed Tumors of the Ovary," by Dr. Walter B. Chase, of Brooklyn, N. Y.

5. "Tubo-ovarian Cysts, with Interesting Cases," by Dr. Albert Goldspohn, of Chicago, Ill.

These papers were discussed jointly by Drs. Stone, Gaston, Price, and the discussion was closed by the authors.

At this juncture Dr. George Ben Johnston made a brief report on behalf of the local committee of arrangements. He said he was highly gratified that the Association had selected Richmond for its place of meeting. The committee had provided some entertainments for the members, which it had been careful to arrange so as not to interfere with the scientific work of the Association. He called attention to the annual dinner, tickets for which could be had of the members of the committee, and stated also that invitations had been received from three prominent clubs—namely, the Westmoreland, Commonwealth, and Albemarle—asking the members to be guests of these clubs during their sojourn in Richmond.

On motion, the Association took a recess until 3 P.M.

Afternoon Session, 3 o'clock.

The President in the Chair.

6. "Movable Kidney; Local and Remote Results," by Dr. A. H. Cordier, of Kansas City, Mo.

7. "Limits of Nephrorrhaphy," by Dr. Hugh M. Taylor, of Richmond, Va.

These two papers were discussed by Drs. Johnston, Dunning, Eastman, Gaston, Davis, Stone, Carstens, Gibbons, and, in closing, by Dr. Cordier.

8. "The Treatment of Periuterine Septic Diseases," by Dr. W. E. B. Davis, Birmingham, Ala.

9. "Shall Hysterectomy be Performed in Inflammatory Diseases of the Appendages?" by Dr. L. H. Dunning, of Indianapolis, Ind.

10. "Shall the Uterus be Left *In Situ* in Excision of the Adnexa?" by Dr. E. F. Fish, of Milwaukee, Wis.

On motion, the discussion of these papers was postponed until the evening session.

The Association then voted to take a recess until 8 P.M.

Evening Session, 8 *o'clock.*

The President in the Chair.

The discussion on the papers of Drs. Davis, Dunning, and Fish was proceeded with. Dr. McMurtry opened the discussion, which was continued by Drs. Duff, Price, Carstens, Goldspohn, Rohé, Baldwin, Miller, Manton, Bovee, Hall, and, in closing, by the essayists.

SECOND DAY—*Wednesday, September* 23*d.*

Morning Session, 10 *o'clock.*—The President in the Chair.

11. "Tubercular Diseases of the Female Genitalia, with Treatment," by Dr. Thomas E. McArdle, of Washington, D. C.

Discussed by Drs. Murphy, Price, Davis, Stone, Gilliam, Longyear, Baldwin, Hoffman, Gaston, Hall, Myers, Macdonald, Goldspohn, Cordier, Dunning, Carstens, and, in closing, by the author.

12. "Dynamic Ileus, with Report of Cases," by Dr. John W. Long, of Richmond, Va.

Discussed by Drs. Macdonald, Murphy, Myers, Gilliam, Meisenbach, Branham, Gaston, Gibbons, Price, and discussion closed by the author.

13. "Spontaneous Rupture of the Uterus During Labor at Term, with Exhibition of Specimen," by Dr. B. M. Hypes, of St. Louis, Mo.

Discussed by Drs. Brown, Martin, Reed, Rohé, Manton, Baldwin, Dorsett, Duff, Carstens, Meisenbach, Hall, Hoffman, Gaston, and discussion closed by the essayist.

On motion, the Association took a recess until 3 P.M.

Afternoon Session, 3 *o'clock.*

The President took the Chair, and invited the Vice-President (Cordier) to preside.

14. The President's Address, "Principles and Practice in Gynecology," by Dr. Joseph Price, Philadelphia, Pa.

15. "Porro's Operation, with Report of a Case," by Dr. Edwin Ricketts, of Cincinnati, O.

Discussed by Drs. Macdonald, Myers, Carstens, Stone, Duff, Longyear, Long, Baldwin, Hoffman, Price, and, in closing, by the author of the paper.

On motion, the Association took a recess until 10 A.M., Thursday.

THIRD DAY—*Thursday, September* 24*th.*

Morning Session, 10 *o'clock.*—The President in the Chair.

16. "Treatment of Puerperal Infection," by Dr. H. W. Longyear, of Detroit, Mich.

Discussed by Drs. Reed, Dorsett, Duff, Chase, Stone, Branham, Myers, Hoffman, Goldspohn, Manton, Miller, Price, and the discussion was closed by the essayist.

17. "Atresia with Retention of the Menses," by Dr. William H. Myers, of Fort Wayne, Ind.

18. "Some Causes of Insanity in Women," by Dr. George H. Rohé, of Sykesville, Md.

19. "Melano-sarcoma of the Female Urethra, with the Report of a Case (Illustrated)," by Dr. Charles A. L. Reed, of Cincinnati, O.

20. "Relation of Visceral Disorders to Insanity," by Dr. Walter P. Manton, of Detroit Mich.

21. "Removal of the Uterine Appendages for Epilepsy and Insanity; a Plea for its more General Adoption," by Dr. D. Tod Gilliam, of Columbus, O.

On motion, the Association took a recess until 3 P.M.

Afternoon Session, 3 o'clock.

The President in the Chair.

22. "Treatment of the Stump," by Dr. James F. Baldwin, of Columbus, O.

Discussed by Drs. Ricketts, Dunning, Macdonald, Chase, Price, Goldspohn, Stone, and Gilliam, and, in closing, by the essayist.

23. "Suture of Large Vessels Injured in Operations, with Demonstration of Method," by Dr. J. B. Murphy, of Chicago, Ill.

Discussed by Drs. Macdonald, Gaston, Davis, Hoffman, and, in closing, by the author.

24. "Pathology and Indications for Active Surgical Treatment in Contusions of the Abdomen," by Dr. W. G. Macdonald, of Albany, N. Y.

Discussed by Drs. Murphy, Ricketts, Stone, Gilliam, Nelson, Davis, Hoffman, Gaston, and, in closing, by Dr. Macdonald.

The following papers were read by title and ordered published in the *Transactions:*

1. "Unnecessary and Unnatural Fixation of the Uterus and its Results," by Dr. James F. W. Ross, of Toronto, Ont.

2. "Report of Three Cases of Uterine Fibroids Complicating Pregnancy," by Dr. M. Rosenwasser, of Cleveland, O.

3. "Albuminuria of Pregnancy," by Dr. A. Fr. Eklund, of Stockholm, Sweden.

4. "Persistency of Malignant Disease of the Clitoris," by Dr. A. Vander Veer, of Albany, N. Y.

5. "Relation of Malignant Disease of the Adnexa to Primary Invasion of the Uterus," by Dr. A. P. Clarke, of Cambridge, Mass.

6. "Differential Diagnosis of Hemorrhage, Shock, and Sepsis," by Dr. Eugene Boise, of Grand Rapids, Mich.

7. "Excision of the Rectum and Vagina for Cancer, with Cases," by Dr. J. H. Branham, of Baltimore, Md.

8. "Memorial of Dr. Hiram Corson," by Dr. Traill Green, of Easton, Pa.

Dr. W. G. Macdonald presented the following:

The following amendment to Art. VI. of the Constitution is offered in accordance with the provisions of Art. VIII.: That the word *nine* be substituted for the word *five* in the first paragraph of Art. VI., said paragraph to read in amended form, "The officers of this Association shall be a President, two Vice-presidents, a Secretary, a Treasurer, and nine Executive Councillors." (To lie over a year.)

On motion of Dr. Davis, a vote of thanks was extended to the President, Dr. Joseph Price, for the able and impartial manner in which he had presided over the proceedings of the Association.

The Chair expressed its appreciation of the courtesy, and appointed Drs. Murphy and Ill to escort the First Vice-President-elect to the platform.

The President, Dr. Price, welcomed the Vice-President-elect, whom, in the absence of the President-elect, he introduced in appropriate words.

Dr. Johnston said: I thank you for the favor you have done me in selecting me as one of the Vice-Presidents of this Association. I am sure it is not due to any merit of mine, but to the fact that you wish to honor the city of Richmond and the State of Virginia, and to express your appreciation of the courtesy which you have received at the hands of the committee of which I have had the honor to be chairman, and of the profession of the city, who have so actively and generously assisted us in making this a successful meeting. It would be useless indeed to say to you that I heartily appreciate this honor, even though I may feel it is unworthily bestowed. It has been a pleasure to have you with us, men who are engaged in the earnest, active work of the profession; a body of men whom not only the general practitioner, but the laity, look to to establish principles and practices which are to save lives and to alleviate suffering, and we feel especially grateful that you have come to Richmond to hold this meeting. We believe that it will have a beneficial influence, not only upon the profession in this city, but in the State of Virginia and the South at large. We have already welcomed you through our distinguished friend, Dr. McCaw, and now we wish to say farewell to you with feelings of deep emotion. It is a sorrowful thing to say good-bye to you, because you

have made yourselves so acceptable and so agreeable in every way. I hope when you have met a number of times in other cities that you will again return to Richmond, and when you do you will meet with the same generous reception and the same cordial welcome that you have received on this occasion. (Applause.)

Dr. Thomas E. McArdle, of Washington, D. C., offered the following preamble and resolutions:

The American Association of Obstetricians and Gynecologists, assembled in annual session at Richmond, Va., September 22 to 24, 1896, desires to present to the Congress of the United States a protest against the passage of Senate Bill 1552.

Whereas, The enactment into law of the specified bill would greatly interfere with and retard the investigations that are at present being conducted at Washington by the laboratories connected with the Marine Hospital, the offices of the Surgeon-General of the United States Army and Navy, and the Bureau of Animal Industry of the Department of Agriculture; and

Whereas, The results of their investigations have been of immense importance to the health and wealth of the people of the country; and

Whereas, More brilliant results are promised for the near future in connection with preventive medicine and the health of men and animals; therefore, be it

Resolved, That this Association protests against the proposed legislation by Congress, which has for its object the restriction of animal experimentation in the District of Columbia; and, while opposing needless cruelty upon animals in the public schools, this Association considers that those who are trained in the special line of research necessary for the conduct of the work referred to are the persons best able to decide upon the advisability and utility of animal experimentation, and should not be hindered in the prosecution of their humane work. Be it further

Resolved, That a copy of these resolutions be sent to the members of the House and Senate of the United States Congress and also to the President of the United States.

The resolutions were unanimously adopted.

The Secretary offered the following resolutions of thanks:

Resolved, That the thanks of this Association are hereby tendered

1. To the Committee of Arrangements, Dr. George Ben Johnston, Chairman, and his associates, for the splendid preparations for the meeting and for the excellent manner in which the details have been carried out, contributing in an inestimable degree to its success.

2. To the Trunk Railway lines centring in Richmond for facilities in transportation, and especially for extending the privileges of reduced fares.

3. To the newspapers of Richmond for extended notices and reports of the meeting.

4. To Mr. Polk Miller and Mr. Ben Valentine for their unique and delightful entertainment of the Association, ladies, and guests at the annual dinner.

5. To Drs. Taylor, McGuire, and Johnston for the social entertainments they have prepared and in which we have so agreeably participated.

6. To the Valentine Meat-Juice Company for the privilege of witnessing an object-lesson in the scientific slaughtering of animals, and for an elaborate luncheon afterward.

7. To the Westmoreland, Albemarle, and Commonwealth Clubs for invitations to their houses, the hospitalities of which we have enjoyed.

8. To the medical profession of Richmond for the delightful luncheon of Wednesday, which will ever be a memory of generous and hospitable courtesy.

9. To the Davis Photograph Company for the opportunity of obtaining a group-picture of the Association.

10. To the proprietors of the Jefferson Hotel for excellent accommodations for the meeting, and for many courtesies individually and collectively while we have been guests in their beautiful house.

11. To Dr. C. P. Brock, Chief Surgeon of the C. & O. Railway, for the privileges of an excursion to the University of Virginia and the Hot Springs, which we are to enjoy to-morrow, as well as for many other attentions.

12. To the visitors, guests of the Association, are we indebted for their presence and the important part they have played in our deliberations. It is to these, one and all, as well as for many other attentions from the Richmond profession, not possible to specify, that we owe our best thanks for having contributed so much toward making this one of the largest and most successful meetings in the history of the Association, one long to be remembered for its scientific and social success, and which are now most cordially and feelingly tendered.

On motion, the Association adjourned to meet at Niagara Falls, N. Y., August 17, 18, 19, and 20, 1897.

WILLIAM WARREN POTTER,
Secretary.

Executive Sessions.

Tuesday, September 22, 1896.

The President, Dr. Joseph Price, in the Chair.

The Secretary, on behalf of the Executive Council, presented a list containing the names of candidates for Fellowship. The Association then elected by ballot the following-named candidates:

Dr. Lewis C. Bosher, Richmond; Dr. John B. Deaver, Philadelphia; Dr. George M. Hughes, Philadelphia; Dr. John A. Lyons, Chicago; Dr. F. D. Mooney, St. Louis; Dr. George H. Noble, Atlanta; Dr. R. B. Rhett, Jr., Charleston; Dr. W. F. Westmoreland, Atlanta.

The Treasurer's report was presented, which showed a balance on hand of $15.16. The Secretary also reported the accounts and vouchers with reference to the contingent expenses for the fiscal year.

On motion, the President appointed as an Auditing Committee Drs. Davis and Rosenwasser.

The Auditing Committee subsequently reported that the accounts and vouchers of the Secretary and Treasurer had been carefully examined and found correct.

Wednesday, September 23, 1896.

The Executive Session was called to order by the President at 7 P.M.

Dr. L. S. McMurtry acted as Secretary of the Executive Council, and submitted the following report:

The Council recommends that the motion on the table, which has now been laid over the time required by the Constitution, proposing to increase the limit of membership to 150, be now adopted. For the next place of meeting the Council recommends Niagara Falls, N. Y. Time, August 17, 18, 19, and 20, 1897.

For officers for the ensuing year, the Council recommends for President, Dr. James F. W. Ross, Toronto, Ont.; First Vice-President, Dr. George Ben Johnston, of Richmond, Va.; Second Vice-President, Dr. John C. Sexton, Rushville, Ind.; Secretary, Dr. William Warren Potter, of Buffalo, N. Y.; Treasurer, Dr. Xavier O. Werder, Pittsburg, Pa. For vacancy in the Executive Council, the Council recommends Dr. W. E. B. Davis, of Birmingham, Ala.

I am instructed by the Council to state to the Association that for the first time it is recommended that the time of meeting be changed. The motive for doing this was that quite a number of the Fellows

have mentioned to the Council that when the annual meetings are held during the last week in September, those engaged in school work are placed at a disadvantage, in that it interferes with their lectures, and especially when they have been on their vacations and have just returned to resume work. By changing the time of meeting to August 17, 18, 19, and 20, 1897, at such an attractive place as Niagara Falls, a good many of the Fellows would make it a part of their vacation, which will enable them to return to their duties at home by the first of September.

I am further instructed to say that correspondence has been had with the proprietor of the Cataract House at Niagara Falls, and the Association is assured of all possible facilities and conveniences, and that the best rates will be furnished. All of which is respectfully submitted.

(Signed) L. S. McMURTRY,
Secretary pro tem. Executive Council.

On motion of Dr. Stone, seconded by Dr. Duff, the Secretary of the Association was instructed to cast the ballot in the affirmative for the report of the Committee. This he did, and the report was declared adopted, and the officers therein mentioned duly elected.

The Secretary was instructed by the Council to report the following names for honorary Fellowships: Dr. George M. Sternberg, Surgeon-General, U. S. Army, Washington, D. C.; Dr. Paul Ségond, of Paris, France; and Dr. James McFadden Gaston, of Atlanta, Ga.

Dr. Carstens moved that the Secretary be authorized to cast the ballot for the election of the honorary Fellows named. This was done, and they were declared elected.

Dr. McMurtry moved that the Secretary be empowered to have an engraved plate made, so that the Association can furnish its honorary Fellows a notice of their election in an appropriate form comporting with the dignity of such an honor. Seconded.

Dr. Duff suggested that Dr. McMurtry's motion be amended so as to authorize the Secretary to procure certificates for every member of the Association.

Dr. Dunning then moved, as an amendment, that there be included also an engraved plate for a certificate of membership for the ordinary Fellows. Seconded.

Dr. McMurtry considered the suggestion an admirable one and accepted the amendment, whereupon the motion as amended was carried.

Dr. McMurtry moved, in view of the increased expense that would obtain through carrying out the provisions just made for securing

an engraved plate and certificate of membership, that, if it be found necessary, one dollar be added to the annual dues of each Fellow to cover the expense. Seconded and unanimously carried.

The Secretary read telegrams and letters from absent members.

There being no further business, the Executive Session adjourned.

WILLIAM WARREN POTTER,
Secretary.

PAPERS

READ AT THE

NINTH ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS,

HELD IN THE

ASSEMBLY HALL OF THE JEFFERSON HOTEL,

Richmond, Va.,

SEPTEMBER 22, 23, AND 24, 1896.

PRESIDENT'S ADDRESS.

PRINCIPLES AND PROGRESS IN GYNECOLOGY.

By JOSEPH PRICE, M.D.,
PHILADELPHIA.

I APPRECIATE the honor attaching to the position of President on this occasion, and consider my election a most gratifying expression of personal and professional kindness on your part. My elevation to the office, which imposes responsibility and places me in close and honorable relationship with a body made up of earnest, enthusiastic, and eminent men of the medical profession, was unexpected, unsolicited, undesired, and undeserved. It was and is my feeling that there are those of our body, my seniors in years, men of wide experience, who have spent toiling lives in the interest of humanity and our profession, more deserving the honor your partiality has conferred upon me. We should honor these men as they pass, for amid the fitful changes of life the opportunity may come but once. I give utterance to that which is sincere when I thank you for that which I cannot otherwise interpret than as an honest expression of confidence and good-will on your part. The best form in which I can convey to you my feeling of obligation is through the intelligent, faithful, and impartial discharge of the duties of my office. We all like position in this "Vanity Fair" of ours; but, aside from all lower motives, a man who is chosen as president of such an organization as ours may well congratulate himself as I congratulate myself, if you will pardon the conceit, upon the fact that his work has been at least partially successful.

Such a mark of confidence and esteem as you have bestowed upon me will ever be for my encouragement. The recognition

of our blind labors, by a sympathetic band of co-workers, is a most delightful refreshment compared with the wordly indifference, the cavil, which usually greets our endeavors. I hope not to fail to appreciate duly the work of others, or to estimate justly the motives and extent of their efforts and that I may not be too vain and arrogant to abandon my own faults, or, recognizing them, too spiritless and weak to correct them.

He serves the profession, our human kind, best who gives us the lessons of his successes.

The failures we all have point a warning finger, and, while they rarely direct a wiser way, are strong appeals for that better wisdom which is the evolvement of experience. The causes of our failures should be subjected to the severest of analysis, and our errors of opinion or practice to a free, generous, and kindly criticism. We have no fear of the men who know us for what we are—worthy men, ambitious only for unselfish, clean, personal, and professional lives; for records with lessons in them, stimulating and guiding to higher planes of usefulness and success. What we find to honor most in Nature is her very equitable distribution of brains, both as to quality and quantity; the wisdom with which she adapts intellect, faculties, aptitudes, and skill to varied human needs; not all alike, yet like in very difference; the faculty to meet and deal with some human necessity, responsive to some want; the courage and ability to mitigate some evil, correct some vicious condition, reduce the total of human suffering and add to the total of human happiness.

The doctrine of disease holds a peculiar place among the natural sciences. It is laid down in the opening sentences of the Hippocratic treatise that the medical art upon which all men are dependent should not be made subject to the influence of any hypothesis.

Even the old father of medicine gave utterance more than twenty-three hundred years ago to a truth which many physicians of to-day fail to grasp. Every patient we meet is of different temperament, build, and state of health; each particular element in the cure of that patient must be considered from different standpoints of character and disposition, in addition to the difficulties of the actually diseased organ. Only

guides of the most general nature may be employed, and these can only be formed by long and patient trials.

We can make laws for every sort of matter in the universe except the living organism. Geologic formations are easy of conception as compared with the nature of actual live tissue. To come to a fine point, your metaphysician stops with growth. We can observe development, determine its direction sometimes, but never will we be able to define the actual principle of growing, the source of the energy, the power that starts the bud and blade—that

> "Instinct within that reaches and towers,
> And, groping blindly above it for light,
> Climbs to a soul in grass and flowers."

I desire to attach special importance and emphasis to certain utterances of my predecessor, Dr. Carstens. I cannot do it better than in his own words: "We have societies which bring together medical men for the purpose of exchanging views. Some think we have too many medical societies in this country, but as I look around I do not think so; I doubt whether we have enough. Considering the extent of our territory, it can be readily seen that we must have many in order to reach the mass of the profession. Many men travel thousands of miles to attend medical societies in order to give with their own lips views based upon their own experience. Let us continue from the homogeneous to the heterogeneous. Let the profession branch out in every possible direction; let as many societies be formed as possible. Each does some good; it raises up some of the profession to a higher and nobler plane; it prevents many from becoming fossils.

"When we consider the work of special societies we readily see how the men whose experience is large in any particular branch must naturally arrive at correct conclusions ultimately. The path may be circuitous and thorny, but finally it will be smooth and straight. Although the general practitioner often in a jocose manner belittles and ridicules the specialist, there is no doubt that the specialist has done a great deal for the general practitioner."

There should be medical societies, in which every phase of

medical science and art are discussed, in every city and county of every State of our Union. From these the greater bodies of State and national societies can be made up, gynecological, obstetrical, and other special organizations can be recruited.

In the work of professional men special organizations have always performed a most important part. Every branch of industry has developed a society helpful to the interests of its members. Many associations formed by tradesmen have been largely protective. Our profession for some reason has found not so much cause for protective organization, but we have a *more urgent* need of association for the purpose of reporting and discussing methods, the results of our observations and clinical experiences. Men of the trades find no necessity of materially increasing their knowledge of the work. Their occupations are, as a rule, of such a nature as to require little attention after the first periods of instruction and experience. Ours is constantly developing new difficulties, requiring a better application of our science.

It is then that the interchange of our experiences are invaluable to the profession.

There are many warnings which we can sound in associations like this which, if observed, would lead us to guard against many evils. We will instance several. Nothing is more common than the contamination of patients by instrumental interference and local treatment. Dilatations are practised without the patient even knowing what has been done. This is too common a deception for an educated and honorable profession.

I have repeatedly examined virgins coming from specialists and hospitals wholly ignorant of a forcible dilatation having been performed. Several cases of deep fissure of the cervix, in which I inquired as to whether they had not had an abortion or a child. They then told me that they had been etherized and examined. In further evidence, I will relate the history of a case but recently in my hands—one of many within my experience. A young working-woman gives the following history: "I have had a number of operations performed upon me. I consulted Prof. ——. He told me that I had inflammation of the womb, and that he would have to scrape it;

to this I submitted. My general health and symptoms continued the same, with a development of pain on the right side. He then told me that the right ovary was diseased, and would have to be removed. I permitted its removal. I grew very much worse after the operation, and he suggested the removal of the other ovary. He removed it, leaving me more miserable than ever. My sufferings and symptoms he then said were due to displacement of the womb, and urged stitching it forward to the abdominal wall. This was done; no relief followed. He then suggested the removal of the body of the womb, and again I yielded to his counsel. My pain and health at present are simply unendurable." At this point the professor proposed for her relief that she try to ride a bicycle. Upon careful examination I found a large cluster of bowel adhesions filling the pelvis, and on the right side, with a strongly anchored cicatrix to omentum and bowel, a painful and mixed condition of adhesions requiring the most careful surgery to unravel and relieve.

It is important that our special societies should be more than endometritis, parametritis, and perimetritis, or gauze-packing clubs.

Papers read before our societies often elicit views which have a great value; impress lessons which we carry into our work. Some years ago I read a paper before a special society entitled "Major Gynecological Trouble Due to Ignorant and Meddlesome Treatment." It provoked severe adverse criticism. My subsequent experience has not induced me to change the opinions then expressed. I still find that women are *over-treated* for fancied troubles. Dilatation is largely practised on women who, if married, but for this treatment, would conceive. Many so treated before and after marriage are made sterile; many are told that they are suffering from endometritis or an affected uterus, and that curetting and drainage are important, but few of these women conceive. We find a large number of these women with advanced tubal and ovarian disease, with uterine and general adhesions. If such pathological conditions existed before the use of the curette, they strongly contraindicated its use; if not, such treatment certainly bears a causal relation to the conditions found. Operators talk flippantly about the

infected and rotten uterus, and urge its removal; an infected and gangrenous uterus is exceedingly rare; where it exists it is post-puerperal in nature. Endometritis is a disorder of a distinctly specific character. A number of patients have been told that they had an infected uterus and urged to have it removed; upon examination later by more experienced surgeons, marked unilateral troubles were found. After these disorders were corrected conception and child-bearing followed. If the uterus were infected and rotten, such patients would not conceive. The saving of a sound ovary and tube has been followed by conception in the cases of almost every operator of large experience. Such experience must convince us that this complaint (infected and rotten uterus) does not exist. The vaginal puncture or incision with drainage for puriform disease of tubes and ovaries is simply copying primitive methods of treatment; such procedure in many cases can only be followed by unfortunate results. The clean removal of disorganized tubes and ovaries is simple, safe, and curative. The simple evacuation of pus, the removal of enlarged tubes in ovarian abscess when extensive bowel adhesions exist, the freeing of bowel adhesions large and small, and the repair of numerous lesions and disorganized points are the common and important steps of such operation. To dodge such complications by incision or simple removal of the uterus is cowardly surgery. Large numbers of such patients are forced by their unimproved and distressing condition to go into the hands of other surgeons for completed work.

We all recognize the fact that in certain fields of labor theory and practice are closely allied and necessary companions. For instance, the scientist or natural philosopher requires theory in his work. He works from his theories; but, notwithstanding the fact that apparently his success depends upon the truthfulness of his theorizing, I say, without fear of contradiction, that just so far as he has come to a true understanding and analyzation of each factor in his phenomena just that far he has been brought by his experiences in those various departments at some past time. However the facts may be concealed, however deep the reasoning may be, it can be resolved into a certain number of experiences with which the reasoner

has been blessed. The nearer the man approaches to a successful theory, the more extensive and varied have been his experiences. His natural sagacity and acuteness of perception are, of course, important factors in his final triumph. The whole progress of humanity has depended upon experiences. Nature has practised her vagaries upon us while we have been content to consider them vagaries until some new experiences have provided the knowledge or cue which alters our consideration of the phenomena.

In reading of ancient medical works recently, I find that from very early dates there were manuscripts containing elaborate directions for the treatment of every known form of disease. These papers were, of course, the result of deep research and extensive experience on the part of the older men. They were for the use of the younger practitioners, but there were accompanying them very emphatic declarations of the necessity for practice. A thorough familiarity with these directions availed the young physician nothing with the populace. He must be apprenticed to the priest-physician and spend long years in patient observation. He must practice upon the easier cases until he acquired a manual skill which with careful exercise would admit him in time to higher work. Thus we see this early distinction between theory and practice.

By theory we understand the expression by language or certain understood symbols of the reasons, natural consequences, and certain results of definite processes.

In matter, organic and mineral, Nature is inflexible in her motions. The growths and what we call unnatural phenomena among the diseased organs of mankind are as surely accurate in the course of Nature as are her most surprising prodigies and freaks. In our dealings with a diseased and disabled human organism it is particularly evident that in consequence of the importance of our mission and our limited time a degree of judgment and accuracy is demanded the most urgent in all the callings of men. Without arrogance I may say that we physicians, in taking upon ourselves the responsibility of a human life, assuming a knowledge of the most delicate animal formation in existence, relying upon our own natural and acquired powers to relieve and preserve human life through

grave maladies and accidents, occupy a position of high trust and responsibility which is easily recognized. The character and high order of this trust is well expressed by Joseph Marie de Maistre: "A physician without a conscience is as much to be dreaded as a highway robber." To this I would add he is more to be dreaded; one says, "Your money or your life;" the other takes both. As we physicians and surgeons labor for the cure of disease, the correction of the abuse or malformation in the organs involved in the very important process of healthy living, we are impressed with certain particular lines of procedure, over which we become enthusiastic, set claim to originality, and bespeak before all others. Now it is not at all improbable that under certain circumstances we may have been blessed with successful application of our theory, while no degree of success whatever would result in other cases with the appearance of similar conditions. How would a person prosper in recovery acting under the suggestions of a well-meaning group of his old lady friends in regard to curing his cold—under hot baths, oils, and teas?

In mathematical lines theory is the root of all progress—a matter is reasoned out and demonstrated before an actual physical proof is made. Your great French astronomer calculates by the various strengths and directions of lines of attraction the position of an unknown planet, and so correct is his mathematical theorizing that without using his telescope he is certain of that planet. As a proof, he directs a German astronomer, hundreds of miles away, to place his telescope at such and such vertical and horizontal angles. The German does so and finds the planet, with all proportions agreeing to the Frenchman's calculation.

The phases which living animal matter may assume are innumerable. How are we surgeons to know what impurities the blood of our patient may contain? What chemicals the foods contain which his or her taste demands? What atmosphere may have surrounded the patient—what life in her drinking-water, to say nothing of the sweetmeats and so-called luxuries of wines, liquors, etc., possibly of opiates? We encounter a diseased organ in the patient, whom we must aid *immediately*—this is the one great factor absent in many other

occupations—we cannot stop to reason out gradually the cause of the malady and its cure. Here is a living being endowed with the Creator's greatest blessing, mind; a suffering woman whom we are bound by our profession to assist, to relieve of distressing conditions—to restore to as broad a basis of healthful and useful living as possible. We cannot tarry or hesitate. A foul wasting of tissue is progressing, consuming the strength-giving elements of the blood, despoiling not only the particular part which it occupies, but slowly annihilating the life, the activity of muscles, and energy of the whole being; drawing to itself all the force in the whole organism and converting it into *dirt*.

Experience is the only guide in surgery. As a greater number of cases are operated upon, a knowledge of the position of the healthy organs is impressed; but more valuable than this is the idea of the relative strength of the patients. The color of the tissue, flow of blood, appearance of the parts to the practised eye and touch are sure tokens of the remaining vitality or weakness.

There are vibrations of sound inaudible to our ears, scents and degrees of light and shade beyond our capabilities of discernment. Chemical changes, such as are involved in organic growth, incur the changing of the nature of the substance; such changes we are incapable of conceiving. We are on the outside, as it were, of such matters, and must work so quickly, with such marked discretion and accuracy as to be beneficial, in no wise adding to the power of the disease in interrupting or embarrassing healthy organs essential to the life of our subject.

Now as to theories. The idea of trying to form some helpful rules and methods of procedure is excellent, and excites an unusual attention to conditions in the operator which are very valuable to him as he proceeds. But one man can tell another very little.

Theory provides practice for the faculties in concentration and reason. Surmises, thoughts, are very profitable in developing the mind. But what a flimsy thing this theory is in the practical world! How valueless to the physician with his patient before him—that queer patient whose symptoms are

absolutely unconformable to any previous experience! As a matter of fact, the skilled operator in surgery, the marksman, the devotee of every art which requires that peculiar finesse of action and perfect government of the motor centres, acquires his skill as a perfectly natural consequence of repeated experiences. It becomes a matter of adaptation. The whole body tends to the accomplishment of the delicate manœuvre. The mind is centred upon the object in view, and according as its whole attention is absorbed in that object, the resultant action is true or otherwise. We often marvel at the dexterity of the gymnast and frequently at our own feats. It is a matter of common wonderment that such extraordinary skill may be developed by experience. Another factor, however, in this marvellous adaptation of the physical abilities to our common needs is the health of the organs. Surgeons and gentlemen of all vocations desiring the benefits of this peculiar power from training must have an especial care to the highest development of energy and vitality in the body and the particular sense of senses involved in their work. What a fine cook, mechanic, orator, physician, or surgeon you would have by instructing the novice in the theoretical part of his vocation!

In every line of achievement, barring the realms of abstract thought, practice precedes theory. The child learns to walk, not by reasoning that if he keeps the line of direction within his base he will maintain stable equilibrium. He merely desires to walk, and endeavors in a most aimless manner. His attempts gradually become more successful, and he ultimately walks. He talks after awhile because he cannot help himself. He needs some means of expressing his desires. From an early age he attends school, and, absolutely independent of any definite purpose on his part, is gradually developed in mind-practice, and becomes versed in the usual school-room lore as a mere matter of course. As his age increases and his acquired faculties disclose the value and importance of his attainments, he recognizes that the tendency of all his early training has been to prepare him for the selection of a purpose in life, a vocation. Then he chooses his line of work and studies it out at one of our great universities. But let him be ever so learned in the university part of the work, he is still almost valueless

in his profession. It is true, practical illustrations and experiments are conducted in the college course, but the fact that these experiments are of so little value later to the young graduate only serves as additional proof of the fact that practice is the one important element in proficiency. The young doctor cannot help running into ruts by his reasonings and conjectures upon the declarations of his teachers and the authors of his books. His conceit is supreme, an excellent circumstance, since it arms him with a confidence which, if the results of his work are not too severe upon the poor patient, puts him in the way of much practical experience. The peculiar notions and fallacies which spring up in the minds of these young physicians are the direct result of the theorizing done by themselves, based upon the suggestions of the theorists whom they have studied. Theory is one of the cheapest articles in the market. Yet our ablest theorists, true philosophers, have attained the highest honors. We are too apt in our conceits to value our own cogitations upon a subject much above their comparative worth, chiefly because of an innate personal vanity which is common with us, joined perhaps in certain instances with a desire to benefit mankind by the record of our experiences. The trouble is we omit or pass over the necessary period of experience. We are not qualified for judgment as to the reason of certain processes or the explanation of occult matters. The deeply learned only have sanction to instruct. In abdominal surgery, which is such a recent field of labor that the colleges even are not all of them up on the subject, the richest sources for the youthful theorist are open. Not only youth, however, is prone to these errors. More mature years have brought little better discretion as to the propriety of inflicting second-class arguments upon the public. The amount of harm which this mass of literature accomplishes in directing the efforts of its readers is inestimable. Doubtless such literature encourages too many needless operations; is indirectly responsible for the crippling for life of many noble women; stimulates many to attempt delicate abdominal operations for which their experience, their knowledge of intra-abdominal disease, does not qualify them; or, further, to apply some form of palliative treatment which

leaves a serious trouble to grow until the most dexterous and skilful surgery cannot save life. An extensive and accurate clinical and pathological intelligence is absolutely essential if we would do justice to our subject. The tendency in all human endeavor is to overestimate our capabilities in the chosen work.

Milton in literature subjected his entire life-work to the one idea of his immortal epic, Newton in mathematics, Darwin in natural philosophy. Yet even these men labored in an entirely different field of life from ours, their work applied to the intellectual and æsthetic qualities of mankind. Ours is a direct application of science and art to the cure of disease or the removal of diseased organs, and our experiences and emergencies are more strange, varied, and urgent than those of any other work of life. Much less can we therefore assume to govern and direct our work by theories. No more dangerous subject for this aimless work could be conceived than gynecology, for the very reason of its youth. It is a subject which requires the greatest care and judgment in its treatment. The advances of our best authorities must be thoroughly considered pathologically before we can trust ourselves to their doctrines.

Without doubt abdominal surgery has attained to some truly remarkable feats, invaluable to women sufferers. The new field has suddenly developed remarkable features which reflect great credit upon the pioners of our work. The opinion is abroad in the profession that it has become a markedly remunerative practice. It should be; the reward should be commensurate with the benefit. This pecuniary reward and notoriety, deservedly acquired by some of our great leaders proved very attractive to a set of rash young physicians, which I fear has done much to bring our science into disrepute. I spoke of the high reward for successful operations. You must not mistake me as indicating that the practitioners in this line are being overburdened by any superabundance of wealth. The cases which they treat are most numerous among the lower and poorer classes of women; the very character of many of the troubles with which we have to deal naturally accompany vice. These women claim our attention in the name of humanity as directly and with as great a stress of

moral and professional obligation as the most wealthy. If then the few patients can afford to reward specially for services which often are really worth fortunes, this only serves to offset the expense and labor involved in the charity work with which the profession is bound to busy itself. Particularly in the rural districts does this charity work of the physician become most urgent and oppressive. Our country physicians feel obliged to aid all and reap small profit in the squaring of accounts. There is no organized dispensary system to lighten their burden.

The dispensary system which is so invaluable in our large cities is a result of the specialization which has advanced so noticeably within the past century. Eye, ear, throat, skin, in fact all parts of the human anatomy, are now the objects of special study and have established institutions devoted to their diseases, which are there treated most successfully. People generally have not considered specialism as it is—an actual necessity. They doubtless considered it a rather strange development of civilization, and put no more thought upon it. The fact of the matter is, specialization is so inseparably connected with all progress as to be almost synonymous terms. How can a man bring himself to anything like a complete knowledge of the different branches and phases of medical work, for instance in the time preceding his period of manhood or the time when he must prepare himself to earn a livelihood? It is a physical impossibility. The fields are too large. In the early days of civilization the male members of the family performed every part of the rude processes by which the needs of life were supplied. They provided their own clothing, foods, and habitations. These processes became more and more complicated as man grew to reason out comforts and conveniences. Probably for some time he continued as provider for all needs, but it is certain that at some time he abandoned several of his occupations and took up some one of these vocations most pleasing to himself or profitable to the community. His neighbors did likewise. He supplies all of his neighbors with clothing, and in return receives their various wares as he needs them. We have to thank specialization for all our conveniences, for the arts and all those economics which contribute most to our

human pleasures, comfort, and happiness. Our trades to-day present an even more emphatic indication of the value of this system. Men are divided into clothiers, skilled artisans and mechanics, grocers, builders, criminal, civil, and equity lawyers, and so on, each intent upon improving his work. Each man takes his own subject, or even a little part of that subject, to improve and perfect. Result—the civilization of to-day. In medicine this specialization is least noticeable. True, some of our doctors have devoted their lives to the cure of a particular disease, and we have numerous records of the patient efforts of many of our brethren in limited lines of work which are in great measure responsible for what we know regarding the action of certain drugs and chemicals. But the general practitioner is bound so by his community and the necessity of his presence in their time of need that he has practically no chance for specialization. Yet our important office demands more than any other this element of progress. The value of human life is inestimable. We know not how much of the responsibility for disaster through disease rests upon us for our inability or neglect to secure a greater proficiency in particular lines. The general requirements of the local physician occupy so much of his time and attention as to practically bar him from particular research. Yet in no field would special work yield better results or be of more benefit to humanity. However, we may congratulate ourselves that in our day attempts are being made upon specializing the different organs. The general physician must have such a knowledge of his work as will enable him to make a clear and at least an approximately accurate diagnosis of his case and perform the minor surgical operations which demand no special dexterity. The specialist must be ready at call to assist the doctor and add his intelligence at the consultation.

He is the better specialist whose efforts are directed almost exclusively to treatment medically or surgically to a limited variety of human ailments. The very exclusiveness of his study and experience must render him more efficient and successful than those whose energy and study are scattered over a broader field. There is no more versatility of talent and capacity in the medical profession than in many other departments

of human endeavor. As people look upon the physician he is to be utilized, in his own neighborhood in particular, as a general convenience and the all-wise man of medicine. As he specializes he must widen his clientage to obtain the necessary field for the work.

The one other point to which I desire to allude is one upon which I feel sure we may all congratulate ourselves.

We have considerable pleasure in noting the absence of individual vanity, or what has been termed the arrogance of success, among the members of our profession who have achieved some truly remarkable triumph. In every other department of work conspicuous lights are discerned—men who have become distinguished by an invention or some lucky chance. Now, in no work are there more frequent discoveries and additions to the useful aids of the operator than in ours. And nowhere are these additions handed over more gracefully or with a better realization of the true significance of real progress, thanks to that generous spirit of common endeavor which exists and should exist in our work as in no other. Our Association is a great exchange of good-will and experience. We are not an aristocracy. The little man with one kid-gloved hand comes in with the gentleman and physician of the country-side, and each in his own way is a valuable member. All are welcome.

PELVIC DISEASES AND THEIR PRINCIPAL CAUSES.

What Should the Laity be Taught Concerning Them?

By JOHN MILTON DUFF, M.D.,
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Notwithstanding the fact that some of the prominent members of the medical profession have, in talks to the galleries, held the gynecologists up to ridicule and criticised them severely, I do not think any apology is due either the profession or the public for the character or results of the work of pelvic surgeons. Those members of the profession who have been devoting themselves to the care of diseases peculiar to women have, in the face of revilings and professional and public prejudice, worked patiently and persistently, until they are now obtaining results of which they may well feel proud—results far beyond what the most sanguine expectations of the hardy pioneers of a quarter-century ago led them to hope for. They are today charged with irrational radicalism, with an operative mania which is gratified without a proper consideration of the ultimate benefit to the patient. Entreatingly they are urged to adopt more conservative measures, and thus stop the wholesale mutilation which is going on at present, which it is claimed is neither scientific nor humane. Sentiments such as these, indorsed by men of reputation, are eagerly taken up by the lay press as sensational news and advertised by pretenders as an indorsement of their methods of practice. Thus the laity are taught false notions regarding the nature of pelvic diseases and their treatment, and, as it was expressed by a gentleman a few days ago, are led to believe that in many instances pelvic surgery is legalized murder. That there is a great amount of mutilation connected with pelvic surgery no one will deny, but that regular

pelvic surgeons are guilty of reckless despoliation is not, I think, susceptible of proof. We can scarcely be held responsible for the work of general practitioners. For the work of ignorant egotists and pretenders who with brazen effrontery undertake operations for the performance of which they are not qualified by character, experience, or education, the pelvic surgeons disclaim all responsibility. For this they are no more to be held accountable than is the profession in general responsible for the medical pirates and quack salvers who ply their lecherous practices upon the unsuspecting dupes who rush to do them homage.

During the period of the evolution and upbuilding of pelvic surgery no doubt much of the work was crude, and perhaps too much was done by over-zealous operators. That at this day, through mistaken diagnosis, operations are sometimes needlessly performed no one would have the hardihood to deny; that such cases are as frequent as some of the critics say they are, I cannot believe.

It has been my pleasure and privilege to witness operations by a great many of the members of this large and representative Association, and I have the first time to see one of them do an operation where there could have been any doubt about its propriety. Among my immediate associates in my home city, whose operations I very frequently have the pleasure of witnessing, it is indeed seldom that the pathological conditions found are not such as would satisfy any unprejudiced physician of the necessity of the operation. What I claim for the members of this Association and for the operators at my home, I have no reason for believing is any the less true of members of other honorable associations or of operators in other communities than my own. Earnest, conscientious surgeons do not deliberately seek for operations so grave in their character, and heedlessly subject their patients to such serious risk, simply to satisfy their desire to operate. The true pelvic surgeon is governed by a nobler purpose, a more elevated aim. Conservatism in its true sense, the saving of life, relief from pain, the curing of his patient, is his watchword. No one deplores the mutilation necessary in pelvic surgery more than the surgeon who does it. Gladly, indeed, would he welcome milder means of cure. Years of patient investigation, however, by the most renowned observers, have failed to reveal any remedy or

method of cure which will successfully take the place of the scalpel in a certain class of pelvic diseases. In actual practice the specialist has in a large proportion of cases to do with the accumulated effects of disease, with secondary and advanced pathological conditions which call for radical and heroic treatment. Meeting with a cystic ovary, a malignant disease of the uterus, a fibroma or inflammatory suppurating disease of the tubes or ovary, what is to be done? Would I not insult the intelligence of this Association with its ripe experience and mature judgment, if I were to say that hot-water douches, cotton or woolen tamponades, with applications of ichthyol, iodine, boroglyceride, etc., are all that is necessary? Would you not at once, and would not the critics have to join with you in declaring that such a course would be puerile, pernicious temporizing, worse than useless, criminally absurd? The conditions are such that if life is to be preserved and health restored the instruments of the surgeon must be brought into requisition. The true pelvic surgeon is not the enemy of womankind; he is her benefactor, her preserver. If what I have said regarding the necessity of operations and the discriminating care exercised by operators as a class be true, the public should be taught so, and thus impress upon them the absolute necessity for avoidance of the causes of pelvic diseases if they would forever keep from under the hands of the surgeon.

A study of pelvic diseases shows us that their causes in many instances may be avoided, and thus the disease be prevented. Again, we find that a mild primary disease may be cured, which, if allowed to pursue its course into secondary complications, may soon pass beyond the skill of either physician or surgeon. The laity should, therefore, be taught that when evidence of disease, however slight, appears in the pelvis, the safest and best thing to do is to at once consult a competent physician. Who among you is there who cannot call to mind cases resulting in death where early treatment might almost positively have produced a cure? Who cannot recount cases which had been temporized with and which came too late for an operation, which, if it had been performed earlier, would have been almost certainly successful?

If I am correct in my position, which I believe the facts justify me in maintaining, with existing conditions we need not expect to materially decrease the necessity for operating. While those who

condemn because of the too frequent use of the knife may have some excuse for their position, in the main they are wrong and do not properly consider the conditions. They are governed more by sentiment than by a careful analysis of the facts. If the same energy were displayed in an endeavor to prevent diseases of the pelvis by proper initiatory treatment or by disseminating knowledge with regard to prevention that has been exercised in tirades against abdominal and pelvic surgeons, very much more of good would have resulted to humanity.

I do not wish to make any statements which facts will not justify; therefore I will not, because I have no definite statistics, claim that any particular percentage of diseases of the pelvis might be avoided; but I believe the majority originate from causes which it would be possible to avoid.

If this be the case, or even if it be somewhat exaggerated, are we carrying out the noble purposes of our profession in endeavoring to prevent as well as to cure disease, if we do not endeavor to instruct the laity as far as possible regarding those causes which are avoidable? To what extent this should be done, and by what methods can the best results be secured, I hope will be shown in the discussion which this paper may elicit. From the fact that Dr. Hall, who has already discussed the causes of pelvic diseases so ably at a former meeting of this Association, is to follow me with a paper on "The Potent Causes of Pelvic Inflammation," I will not occupy your time in a detailed statement of the various causes of pelvic diseases.

One of the principal causes of pelvic disease, and one which, I am sorry to say, is becoming more common every day, is criminal abortion. This increase is not due alone to an increase in illicit intercourse. There is a sadder side to the subject. This practice, soul-destroying, productive of moral depravity and of physical disease and pain, has invaded the sanctity of the marital chamber, where, in some communities at least, it is increasing to an alarming extent. The young married woman who desires a long honeymoon resorts to it because her pleasures must not be interrupted by the honest fruit of her womb; the woman of society, whose time is too precious to give to the care of children; the woman who believes she has already a family as large as she can support and care for—all unblushingly resort to it, and thus lay

the foundation for disease which will eventually make life a burden. My observation shows me that while much of this is done with a careless indifference to results, much of it is done through ignorance of its sinfulness and of its physical danger. The impression that it is sinless during the first three months of gestation, and that during this same period it is devoid of danger, has considerable to do with its frequency.

I am not here to discuss the subject from a religious point of view, but it occurs to me that the same life is destroyed at one month as is destroyed at four or six months, and to say it is sinless would be as unreasonable as to say it would be sinless to take the life of a boy of ten, but wicked, villainous murder to take the life of a man of fifty years of age. With regard to danger, if there is a difference so far as the period of gestation is concerned, I believe there is more danger during the first three months than at any other time. The danger, however, at any period is not alone from hemorrhage or putrid infection, but as well by septicemia due to the absorption of microbes carried into the uterus on a filthy catheter or bougie.

Imperfect intercourse and the various methods used to prevent conception, if persisted in, are all productive of more or less harm. In this connection I cannot abstain from criticising the use of the intrauterine protectors, the use of which is, I am told, encouraged by reputable practitioners to the extent that for a stated sum monthly they introduce them just after menstruation and remove them again prior to the next period. Such a practice cannot, it appears to me, eventually do otherwise than produce an endometritis which will entail a retinue of evils the gravity of which it is terrible to contemplate. The invasion of disease may be so insidious as not for a long time to cause alarm; but these women will live to curse the man or woman through whose influence they were led to use them.

The large number of cases of pelvic disease coming under the care of every gynecologist which can be traced to a careless toilet during labor or the lying-in speaks, in a manner which cannot be misunderstood, of the necessity for the education of the laity upon the importance of asepsis in the lying-in room. A very important matter is one upon which the laity in general appear to have a wrong impression: that is the common belief that menorrhagias,

metrorrhagias, and foul discharges are a necessary concomitant to the "change of life"—an opinion I have been astonished to find practitioners of years of experience coincide in. You gentlemen know too well that thousands every year are deluded by this fallacy until all hope of relief is gone for a malignant disease of the uterus. I have not found as large a percentage of cases coming under my care in which I could trace the cause to gonorrhea as some others have. That it is a very potent cause, however, must be patent to every pelvic surgeon of experience. With regard to it the laity have very loose notions. Most of them regard it as a comparatively harmless disease. The worst feature in connection with it is that the suffering consequent upon it is not always confined to those who reap the reward of their own misdeeds. Faithful, loving wives are called upon to suffer for the misdeeds of recreant husbands.

I have often thought it would do much good if it were possible to impress the boy, in the midst of his revels in satiating his lust, with the fact that the price of the gratification of his passion consisted in the garnering up of pain, misery, sickness, and death for the woman who is to give her life to him at the marriage altar. Again have I thought, if it were possible, to picture the life in store for that loving daughter, the anxious mother seeking to secure a highly respectable and wealthy marriage for her would be more solicitous about the moral character of the suitor than she is now about his family name and family treasures.

I earnestly hope that what I have said in my feeble way may help to silence the unjust critics of pelvic surgeons, as well as stimulate us all to greater activity in the prevention of pelvic diseases by enlightening the laity concerning their causes and how to avoid them.

DECEPTIVE SIMILARITY OF SIGNS AND SYMPTOMS IN INTRA-ABDOMINAL DISEASE.

With Cases.

By WALTER BLACKBURN DORSETT, M.D.,
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In order to arrive at a conclusion and formulate a diagnosis in a given case, be it medical or surgical, the practitioner must exercise care and judgment in the consideration of such signs and symptoms as are presented. Each should be weighed and mental annotations taken as to their value individually and collectively. When so-called pathognomonic symptoms and signs stand out in bold relief the question of a diagnosis is comparatively easily answered; but when certain seemingly trivial signs and symptoms also accompany the so-called pathognomonic ones a proper cognizance of their presence should also be noticed. The field of abdominal surgery is one in which greater care and more accurate knowledge is necessary on the part of the surgeon than any other, the surgery of the brain not excepted. This is particularly true in the abdominal surgery of the female; for not only do we here have visceral diseases to cope with, but the diseases of the internal generative organs also, which may or may not mask or complicate operative work. Neoplasms and inflammatory growths, being continuous with or contiguous to visceral lesions, cannot always be outlined and differentiated by known methods of examination, as in inflammatory diseases of the uterine adnexa in their chronic stages or in the beginning disintegration of neoplasms. For the reason that pus does not always point at the most dependent point, but rather at the point of least resistance, the non-inflammatory diseases of viscera or parts thereof may be easily confounded with inflammatory troubles.

Family and Personal History and Habits. The family history is of importance only so far as hereditary influence may affect a case under consideration. Tubercular disease is supposed to play the most important *rôle*, yet, so far as the writer's experience goes, in not a single case of tubercular peritonitis or tubercular disease of the appendages found on operation was there a direct history of tuberculous disease in the ancestry. The habits of the individual are of far more importance, should a truthful account be given the surgeon. Women, through fear of the disclosure of pernicious habits, frequently, when they ought to know that it is to their advantage, refuse to give a truthful account of their previous ailments, and, as a consequence, the surgeon is misled, and a wrong diagnosis may be the result.

Pulse and Temperature. The pulse and temperature, being good guides in acute affections, cannot always be relied upon as implicitly in more chronic forms of disease, and the general anemic state of the individual now becomes more important.

Knowledge to be Gained by Manual Examination. By the sense of touch we are generally enabled to distinguish lesions of normally located organs as well as to form an idea of their character; still the fluctuations of fluids in cysts are not always to be distinguished from fluids in compartments due to inflammatory exudates. Fluctuations of fluids, when pent up by thick walls, are not always to be distinguished from resiliency in soft, myomatous growths undergoing disintegration; particularly is this true in the differentiation between myomatous disease and deep fluctuation elicited in intraligamentary abscess. Malposition of different organs, when not presenting marked constitutional disturbances, is sometimes diagnosticated as pathologic lesions of the normally situated pelvic contents. This is particularly true of the spleen, kidney, gall-bladder, and occasionally the transverse colon, loops of small intestine, and vermiform appendix —a spleen for an enlarged ovary or a tumor thereof, a kidney for the same, a sacculated transverse colon or loop of small bowel for a solid or cystic tumor, a diseased appendix for ovarian or pelvic abscess, and the like.

The Use of Analgesics. A large number of patients that come into the hands of abdominal surgeons are from the practice of the family doctor, who may or may not have recognized the true nature of the trouble, and, whether he has or has not, he has not

failed to attend to what he conceived to be his first duty—namely, relieve pain; so that what would have been a valuable index to the true condition is lost or destroyed.

The foregoing are a few instances of the difficulties that beset the abdominal surgeon. Conditions physiologic are arrayed against conditions pathologic, and signs and symptoms pathologic against each other; and not infrequently, even by our best men, the abdomen is occasionally opened to find a far different condition than was anticipated. Unfortunately for the good of the science, few such operations are ever reported, unless by some rival surgeon, and then not in the regular way. The exploratory incision should not be regarded as an evidence of ignorance, but as a legitimate means of diagnosis; and the off-hand diagnostician, or the surgeon who never makes mistakes, should be looked upon with at least a grain of suspicion. Statistics are supposed to be the guides in determining the choice of operative procedures, as is evidenced by their frequent quotations in debates by surgeons who take opposite views in discussing operations; yet when we consider the brilliant work of men whose operations are so entirely different, we cannot refrain from expressing the belief that statistics cannot always be relied upon. "Should a voice come back to us from the dead, the cry would be more light, more knowledge, for our profession." These were the words uttered by the late Dr. John T. Hodgen, one of the most conscientious and able surgeons that it has ever been the writer's lot to know. They were uttered at a time long before the now known methods of examination and improved operative technique were practised. Yet, in the face of the fact that much life-saving work has of late been achieved, we still find ourselves seeking and pleading for more light.

In order to illustrate the foregoing statements the following cases are here submitted:

Case I.—Mrs. M., aged twenty-eight years, married eight years, no pregnancies, was seen by the writer about a week after having recovered from an attack of malarial fever. Temperature 99°, pulse 90, tongue slightly coated, and a tendency toward diarrhea; complained of general abdominal tenderness, and palpation of the abdomen revealed a slightly more tender spot at McBurney's point. No swelling or tumefaction could be felt. Vaginal examination revealed a retroversion with fixation; no tubal enlargement

nor tenderness could be made out. No vaginal discharge. Diagnosis: gastro intestinal irritation with chronic inflammation of pelvic contents. A diarrheal mixture was prescribed, and patient was told that further attendance would probably not be necessary. Four days afterward the writer was telephoned to call some time during the day, but the call was not made until late in the afternoon. At this visit the temperature was found to be 99.8° F., pulse 100. Abdominal palpation now revealed a distinctly tender spot with some swelling at McBurney's point. Upon careful questioning the patient stated that she had eaten heartily of Frankfurt sausage on the day before and had been awakened during the night by cramps at the navel, but that all pain had been quieted by ten drops of laudanum she had taken on her own responsibility. Bimanual examination was again resorted to, with negative results. Diagnosis at this visit was appendicitis, first stage. Drachm doses of salts were prescribed, and patient was urged to go to the hospital, but positively refused. On the next day the patient was seen and found sitting in a rocking-chair, and, aside from slight tenderness over the abdomen, was feeling quite comfortable. The salts had acted freely. Bimanual examination again gave negative result; temperature 99°, pulse 100. Patient was ordered to bed and advised to keep quiet. The case was regarded as better and thought to be out of danger. On the following day the pain became more severe, and the patient came to the hospital of her own accord. Upon examination the right iliac fossa was found to be exceedingly tender and fluctuating. Vaginal examination revealed nothing aside from what was found at the previous examination. Temperature 103°, pulse 130. Diagnosis: ruptured appendiceal abscess. She was anesthetized, placed upon the table, and a section made in the median line. A large sac was found on the right side, filled with fluid-blood and laminated clots, and when washed out a rent in the posterior layer of the broad ligament was found, which communicated with another rent in the Fallopian tube. The appendix was found to be perfectly healthy and was not disturbed. A thorough washing-out of the sac was done, and ligation of the tube with a portion of the broad ligament; a glass drainage-tube was introduced. The utmost care was taken by the nurses, and unceasing watchfulness was exercised by the house surgeon, but the temperature

remained high, the pulse became worse, the abdomen became distended, and she died on the third day.

Post-operative diagnosis: ruptured tubal pregnancy without the usual symptoms. There was no history of shock, no cessation of menstruation, or nervous symptoms of pregnancy; no passage of decidua; no vaginal discharge of any kind, but in its stead a good history and train of signs and symptoms of inflammatory disease of the appendix.

Case II.—January 8, 1895, was called to see a young lady aged eighteen years, of fine physique and of good family. A history of chronic constipation with occasional attacks of umbilical colic. At this visit the temperature was 105°, pulse 140. The family was not alarmed, inasmuch as she had about a year previously a similar attack and had been told by the family doctor that she had appendicitis, and was cured by successive doses of salts. By external palpation a circumscribed tumor about the size of a man's fist was outlined in the right iliac region. It was extremely tender to the touch and deep fluctuation could be detected.

An earnest request was made for a vaginal examination, but this was positively declined. The facial expression was that of great pain. Further attendance was denied unless consent was gained to make a section. The diagnosis of appendicitis was made, and our opinion was clearly stated to the patient and the family. After finally gaining their consent the abdomen was opened, and, instead of finding a diseased appendix, a leaking tube and a puddle of pus were found; the appendix having been shut off, and in no way was it involved. The sac was washed out, glass drainage made, and the patient, now already septic, made a slow but good recovery. (I afterward learned that her sweetheart had been treated for gonorrhea.)

Post-operative diagnosis: pelvic abscess of gonorrheal origin due to leaking tube.

Case III.—Mrs. H., a brunette; aged thirty-five years; weight 120 pounds; height 5 feet 4 inches; married fifteen years; mother of three children, with a history of easy labors, with no pelvic inflammation following; age of youngest child, three years; menstruation irregular since its birth, six months sometimes elapsing between periods, the last menstruation occurring five and a half months prior to our visit. Upon examination the patient was found

to have a distinctly distended abdomen, with a girth measure at the umbilicus of forty-nine inches. Respiration 28. Dyspnea so great that it was impossible for her to assume the recumbent posture. Mammary glands flabby and with no unusually darkened areola. No history of morning nausea nor fetal movements. Bowels constipated and bladder irritable. External palpation revealed distinct fluctuation. Digital examination per vaginam revealed a hard and small cervix, pointing anteriorly toward the bladder. In the cul-de-sac of Douglas a round body, supposed to be the uterine body in the state of retroversion. Rectal examination with patient in genu-pectoral position revealed nothing further than that possibly this body was not adherent. By bimanual examination fluctuation was distinctly felt, and, in addition to the fluctuation, a firm, oblong body, approximately measuring in length four inches, in thickness two inches, on the left side. This body was found to change its position when a change of posture of the patient was made. Diagnosis: multilocular fibrocystic tumor. Consultation was asked for, and three of the best abdominal surgeons of St. Louis were called in and confirmed the diagnosis and assisted in the surgical work.

The abdomen was opened and what appeared to be a large cyst presented itself; whereupon one of the surgeons handed me a sharp-toothed cyst forceps, with which he requested me to draw the cyst forward. Another equally good surgeon handed the trocar. Both instruments were refused, and the incision extended and the mass brought well up to the incision, and upon close inspection the Fallopian tubes were seen on either side and continuous with the tumor (?). The whole mass was immediately dropped back into the abdomen and the incision closed.

Post-operative diagnosis: hydramnios with death of fetus before quickening.

The patient was kept in bed for three weeks, when labor set in, which speedily terminated by three or four pains, the fluid, fetus, membranes, and placenta all coming away together. So rapid was this labor that I was not able to reach the hospital before it was terminated, and when I got to her bedside I found the fluid had come away in such quantities that the mattress was soaked through and the floor presented the appearance of a small-sized Noah's flood. The little dead and shrivelled fetus, with mem-

branes and placenta, was lying between the patient's thighs. She made a good recovery and left the hospital in two weeks, much to her relief and mine also. Before her leaving, however, I obtained her permission to make another examination, which was particularly instructive. When she was placed on her back the uterine body was found to be normally situated, but posteriorly in the cul-de-sac of Douglas, and attached to the posterior uterine wall was outlined a small subperitoneal fibroid, which had been taken by myself and confrères for a retroverted uterus. This case was one in which no symptom of pregnancy was present, aside from the girth measure.

A case or two might be mentioned in detail, but would serve no additional purpose. Suffice it to say, once I found a long and inflamed appendix attached to the fundus of the uterus, which was diagnosticated pyosalpinx; twice to the ovary and Fallopian tube, in which neither was involved. Once I operated for appendicitis and found that it was not in the least diseased, but the tumor was a fecal impaction of the caput coli, a constricting band which may or may not have been etiologically inflammatory, but causing signs and symptoms of appendicitis by narrowing the lumen of the bowel, producing pain, elevation of pulse and temperature, and free emesis.

The above were my own cases and were operated upon by me. I am constrained to relate them for the purpose they may serve others. They were studied carefully and with caution, and the mistakes in diagnosis are acknowledged.

While we should not undervalue the importance of well-known and uniformly practised methods of examination, we should be ever mindful of possible complexities that may be encountered in the abdominal section. For this reason the diagnosis and prognosis should always be well guarded.

THE MOST POTENT CAUSES OF PELVIC INFLAMMATION.

By RUFUS B. HALL, M.D.,
CINCINNATI.

It is well recognized by the profession that the most potent causes of pelvic inflammation are septic infection following labor and abortion, and gonorrheal infection; to these we might add the extension of inflammation to the tubes and ovaries from chronic endometritis. With these facts before us it is only necessary to study carefully the various modes of infection to be masters of the situation, so far as it is possible to be.

While septic infection following childbirth is by no means the most frequent cause, for convenience it will be first considered. It is growing less and less frequent as we better understand the laws of cleanliness in midwifery, so I shall not consume much of your time in discussing this phase of our subject; but there will always be cases of infection following labor which are in no wise due to the negligence of the physician in charge. When infection does occur the patient succumbs within a few weeks, or recovers after many weeks of severe illness to become the subject of chronic endometritis. If the patient survives more than sixteen or twenty days from the commencement of her attack she usually recovers. Occasionally we see all the manifestations of chronic sepsis lasting for weeks or even months. It is a perplexing problem, in many of these cases, whether to advise an operation or not. After pus-formation can be diagnosticated there can be no doubt as to the advisability of removing it. I can now recall three cases following labor at full term in which pus was formed in large quantities many weeks after the commencement of the illness. I was called when the pus was pointing in each case.

The first case was in the practice of Dr. Rinehart, of Covington, O., in 1893. The doctor was called several days after infection was well established. Some four weeks after delivery I was

asked to see her, at which time all the manifestations of sepsis were pronounced, with a distinct fluctuation and pointing midway between the anterior superior spine of the right ilium and the umbilicus. The patient was anesthetized, the abdomen opened, and two or three pints of thin, yellowish pus liberated. The cavity was irrigated and drained, and the patient made a slow recovery.

The second case was in the practice of Dr. Fisher, of Lebanon, O., in 1895, and was seen several weeks after confinement. The abscess was pointing near the right anterior superior spine of the ilium. The patient was greatly exhausted from profound sepsis. She was anesthetized, the abscess opened, irrigated, and drained, but the patient died from her septic condition some ten days following the operation. This patient was known to have a small pelvic tumor, size of an orange, for several years preceding her confinement. At the previous confinement, some three years before, she had a severe attack of abdominal inflammation threatening her life for several weeks. At this time the tumor was discovered, and injury to it during the confinement was supposed to be the cause of her attack. She was advised to have the tumor removed, but would not consent. Her last confinement was followed immediately with an attack of inflammation in the abdomen. The fact that she recovered from the other attack without operative interference made it more difficult to get the consent for any operation early enough to be of any avail. The exact pathological condition causing the infection in this case cannot be stated, but it is probable it was rupture of a small dermoid tumor of the ovary.

The third case came under my observation recently. Four and a half months ago, a strong, vigorous German woman was delivered by a midwife. On the second day following she had a chill, and soon after Dr. Wendel, of this city,[1] was called. All the manifestations of sepsis were present, and the usual treatment for this condition was carried out faithfully. The patient had a tedious illness with varying fluctuations, sometimes better, sometimes worse. June 9th an enlargement was observed over the region of the left anterior superior spine of the ilium, and that thigh was flexed upon the body. I saw her on the 10th. Fluctuation could be detected in the swelling. She was sent to the Presbyterian Hospital, and on the 11th was anesthetized, an opening made over the most

[1] Cincinnati.

prominent point external to the anterior superior spine of the ilium, and the pus evacuated. Passing the finger into the opening, it was found that the entrance into the pelvic cavity was an inch above the middle of Poupart's ligament, and a second opening was made over that point so as to be better able to drain the pus cavity. This patient is yet in the hospital, making a slow convalescence. She will probably recover.

In the first and last cases the infection should have been avoided. The second case is one in which infection took place from disease in the pelvis preceding her delivery. Similar cases, no doubt, are rare, yet must always be considered in the management of septic cases. I have knowledge of two other such cases.

A very frequent cause of pelvic inflammation is septic infection following abortion. A septic endometritis following abortion is not well when the patient is able to leave her bed, but it requires an indefinite time for nature to repair the diseased process. Not infrequently the patient suffers vague pains in the pelvis and slight backache, and complains of some leucorrheal discharge associated with irregular menstruation. She applies to her physician for relief, and upon examination it is plainly evident she is the subject of salpingitis directly due to her endometritis. The salpingitis may go on to suppuration in the tube, notwithstanding well-directed treatment. In others the symptoms are not so pronounced. The patient suffers, for months, only from inconvenience at her menstrual periods, which are somewhat prolonged. She thinks she is so near well that it will only be a matter of a few weeks until she is restored to perfect health. Finally her sufferings become more pronounced; she applies to her physician and he finds unmistakable evidence of salpingitis. Salpingitis is developed after septic endometritis much more frequently than is generally supposed. A. Martin, of Berlin, puts the number at 48 per cent. of all cases. Others estimate its frequency at from 25 to 50 per cent. Just how frequent it is is a most difficult thing to determine in family practice. It is a preventable condition in a large percentage of all cases. The results to the patient are so disastrous, it is all the more important that we should study every phase of it. That it should follow endometritis so frequently is very easy to understand when we remember that it involves the tubes by extension of the inflammation through the lining membrane.

That abortion is of very frequent occurrence every physician knows. Many of these cases are complicated by the retention of decomposing membranes. That nature is competent to relieve a large percentage of these cases is well known. In a certain percentage the patient suffers septic endometritis from the retained membranes. This lays the foundation for a long train of symptoms with untold physical suffering. I believe that self-induced abortion in women is more frequent than is generally supposed. I am also convinced that it is the popular belief that there is no danger at all from abortion before the third month. For this reason many women do not hesitate to rid themselves of the undesired product of conception. We, as physicians, know full well that it is in the early months there is most danger to the patient from retained membranes. I believe that many women would be deterred from producing abortion if they knew the real danger of it. We would have better results in all septic cases if the patient were anesthetized and the uterus thoroughly emptied of its septic contents. If this is done within a day or two after septic symptoms are manifest the patient usually makes a very prompt recovery. The expectant treatment frequently results in a subsequent salpingitis.

One of the most frequent causes of pelvic inflammation is gonorrhea. It is a well-recognized fact among physicians that almost all women suffering from gonorrhea, outside of houses of prostitution, contract it from their husbands. My experience leads me to believe that in many of those cases suffering from its effects the husband contracted the disease, but believed himself cured before his marriage. The more I see of the ravages of latent gonorrhea in women, the more I am convinced of the fact that the profession is derelict in its duty to its patients in the dissemination of knowledge upon this subject. The majority of my hearers today were taught as medical students that gonorrhea was as harmless as a cold; that it could be easily cured in a few days by a little balsam of copaiba or oil of sandal, with mild astringent injections. As soon as the purulent discharge ceased the patient was pronounced well. It was only where a stricture was developed that the physician was called to treat the patient after the first few weeks. This is a false doctrine and one that needs correction. It must be rectified by the profession at large, or we cannot do our whole duty

to our patient and his prospective wife. I have on many occasions been compelled to remove suppurating tubes and ovaries from women who had contracted the disease from husbands who believed themselves well when married. While I am not willing to indorse the extreme views of Noeggerath, there is some good, wholesome knowledge to be gained from his doctrine. He asserted that gonorrhea remained uncured in 90 per cent. of all men affected. Another assertion which he makes is that of one hundred women marrying men once affected with gonorrhea, scarcely ten remain absolutely well; the others suffer from some of the ailments directly traceable to the disease. These figures, no doubt, are exaggerated.

The facts nevertheless remain that a very large per cent. of women marrying this class of men do suffer from latent gonorrhea, and not a few of them finally develop suppurating tubes. Since the discovery of the gonococcus it is perfectly easy for the gynecologist to demonstrate the existence of gonorrhea in his patient without her knowledge. I have no hesitation in asserting that gonorrhea is more destructive to women than syphilis. It is a duty every physician owes his patient to impress upon him the fact that he is not well as soon as the urethral discharge disappears. With our present knowledge upon this subject, we can assert that no man has a right to marry until the irritant injections show the absence of gonoccoci in the discharge. This is not infrequently a period of two years after the beginning of the acute symptoms. The test should be made by the injection of a 5 per cent. solution of nitrate of silver, which will cause a slight urethral discharge for a few days only. If this discharge does not reveal the presence of the gonococci, he can marry in safety; but if it does, he should be prohibited from marrying, for if he should he will certainly infect his wife. If the profession would advocate and practise this doctrine, we would right many of the existing wrongs. I am a firm advocate of legislation upon this subject. I believe every man should have a certificate from the health officer of freedom from syphilis, gonorrhea, and, I might justly add, tuberculosis also, before he is granted a marriage license. Until legislation is enacted the parents of the prospective bride should demand from the intended groom a certificate of freedom from venereal diseases by a physician of their selection. If this could be brought about,

there would be no necessity for fully one-half of the sections now made, and a corresponding amount of suffering, both mental and physical, would be obviated.

DISCUSSION ON THE PAPERS OF DRS. DUFF, DORSETT, AND HALL.

Dr. J. Henry Carstens, of Detroit.—Mr. President: It seems to me the papers cover the ground pretty thoroughly, but I desire to accentuate one or two points. With reference to Dr. Duff's paper, in which he speaks of abortion, I see and hear a good deal about it, as I suppose do others, and yet after preaching almost constantly, as does the profession, about the dangers of abortion, it seems to have little or no effect. When prominent ministers of our leading churches go to physicians and ask them to produce abortions on their wives, there would seem to be very little hope for the reformation of the flock. Still, we must constantly keep on preaching about the dangers of abortion.

I think the paper of Dr. Dorsett dealt with a subject that is very important indeed. The difficulties of making accurate diagnoses are very great, and anything that can be contributed to our knowledge and ability to diagnosticate disease is very desirable. To operate on every case, even when we are not sure of our diagnosis, is wrong. I think every means of diagnosis ought to be exhausted; that we ought to investigate thoroughly a condition in all of its bearings before we resort to abdominal section. If we open the abdomen frequently in those cases in which we are uncertain as to the diagnosis, it will encourage incompetent practitioners to do these operations; the results will be disastrous, and they will necessarily react on us. I say every means should be employed to assist us to make a differential diagnosis and find out exactly what the condition is, and such a paper as that of Dr. Dorsett contributes a great deal to our knowledge. If every member will take the pains to report his work, we will be able to diagnosticate our cases more accurately before we open the abdomen. It is true there are certain cases that are obscure, and which with the present state of our knowledge we are not able to accurately diagnosticate; we are therefore justified in making an exploratory operation occasionally for the purpose of establishing a diagnosis.

The paper of Dr. Hall covers similar ground in a little different way, and I must say that I agree with everything virtually that he says. I do not believe, however, that there is as much latent gonorrhea as is thought to exist by some. I admit there are such cases, and when I think of the number of cases of gonorrhea there are in the land, I sometimes feel astonished that every woman has not got a pus-tube. Dr. Hall took the position that puerperal sepsis is a frequent source of pus-tubes. I do not believe that every case of pus-tube is due to gonorrhea, but to abortions more than anything else. There is one other point that we cannot emphasize too strongly. It is to impress upon the general practitioner and the laity that an abortion is not a simple thing, even though many women think it is. When a woman has an abortion and everything passes off smoothly, whether it be produced artificially or accidentally, she thinks she is as good as ever, but in a great many instances there is an infection of some kind, not necessarily gonorrheal. There is a retention of more or less membrane, finally resulting in a septic infection of the uterus. This infection may not be severe at first, but it is that variety of chronic endometritis which frequently terminates in salpingitis, pus-tubes, and in pelvic inflammation. If there is the slightest fever, the slightest inflammation of the uterus or of its mucous membrane; if there be some soreness following the miscarriage, the only correct method of treatment is to put the woman under the influence of an anesthetic, clean out the uterus, sometimes use a blunt curette, then swab it out with strong carbolic acid, making it clean and aseptic. If this course is pursued, we will have fewer cases of endometritis and pelvic trouble following miscarrige than we do at present.

With reference to what has been said concerning marriage, I indorse a great deal of what Dr. Hall has said. I think we, as physicians, should take the initiative and continually preach and educate the people to the end that they must not be so careless about marrying. Women are not the only ones who are responsible in this regard. It is true, mothers are sometimes anxious to have their daughters marry desirable persons, particularly those who are wealthy. More attention should be paid to the physical condition of those who contemplate matrimony. If a woman has a right to ask a man whether he is well physically, a man has the right to ask the same thing of the woman. I have seen men and women marry that were not in a condition to do so, and I firmly believe that everybody contemplating matrimony ought to have a certificate of health to entitle them to a marriage license. I am not one of those who believe that we need laws for

every little thing, but there should be an unwritten law on a subject that is so necessary for the future welfare of the people.

Dr. W. E. B. Davis, of Birmingham.—I am sure we have all enjoyed the papers to which we have listened. I have never believed that gonorrhea played so important a part in the production of pelvic inflammation as is taught by a number of our leading men. I think one's conception of the causes of pelvic trouble will depend largely upon the class of practice that he does. The cases met with in dispensary practice will perhaps be different from those encountered in another class of practice. I believe that more than 50 per cent. of the cases of pelvic inflammation are due to puerperal infection, either at term or premature delivery. A great many cases are what may be called mixed infection, and we attribute some cases entirely to puerperal infection where there was a latent gonorrhea lighted up by a slight infection that would not have caused any trouble had it not been for the existence of the previous gonorrhea. In this way we give more credit to puerperal infection than there is occasion to.

As to tubercular disease, more importance is being attached to it as a cause than it deserves, and I think those who are operating a good deal will find that only a small per cent. of cases have their origin in tuberculosis.

I was very much pleased with the report of the case by Dr. Dorsett in which he operated for an abdominal tumor and found hydramnion. Two years ago I had a similar case in which there was a fibroid of the uterus associated with hydramnion. I made a diagnosis of pregnancy between the third and fourth month, but the collection of fluid was so great that it appeared to be connected with the uterus, which had a thin wall. I found a parovarian cyst, operated to remove this cyst, and found a distended uterus. The woman recoverd from the operation and was delivered some five or six weeks later of a fetus. I saw Mr. Tait make the mistake of opening the abdomen for an ovarian tumor, in which case he removed the uterus and there were twins. So it is easy to see how a mistake might be made in cases of hydramnion, as the uterus will be so large in the early months as to cause confusion.

The President.—Dr. Bantock made a similar mistake.

Dr. James McFadden Gaston, of Atlanta.—In the course of this discussion I have been impressed with the fact that some points have not been touched upon, and which are regarded generally by obstetricians and gynecoloists as of considerable practical importance; hence, rather than discuss those matters which have already been brought to the attention of this body, I would ask its consideration

to some of those untouched points. One of these is in connection with the prophylactic management of a case of pregnancy prior to the period of confinement. I suppose that extreme hygienic precautions might warrant in some instances the use of antiseptic washes prior to labor. I understand that this is the proper thing to do where we have a fluor albus or troubles of this kind. But there is a growing tendency on the part of some members of the profession to resort to measures which are regarded as precautionary, yet injurious, in preparing the female for labor and using antiseptic washes in advance of confinement. It strikes me that this is altogether out of place. When we have a normal condition of things nature should be allowed to take its course, unless there is reason for interference. The first speaker alluded to the fact in connection with abortions that they were probably more dangerous prior to or up to the third month than afterward. I can very well comprehend that this might hold good under some circumstances; but, as a rule, I am satisfied, speaking within my own observation, that those abortions which have taken place just prior to the seventh month have been attended with more constitutional trouble and disturbance than abortions at an earlier period of gestation, and it is reasonable to presume, with the development of the fetus, that a greater tax upon the vital powers of the mother would be made than at a previous period.

Another point that I wish particularly to refer to, and which came prominently to my mind while the discussion was going on, is the fact that some practitioners resort to irrigations of the uterus. I do not speak now of irrigations of the vaginal canal after confinement, as a precautionary measure. Independent of the fact of the existence of septic contamination, it has been held as proper to resort to vaginal washes, and in case a disintegrating process is going on, if there should be anything behind, I can well understand how washing out the womb would do good, but I do not think it proper to resort to uterine irrigation as a prophylactic against septic conditions, although it has been considered good practice by many practitioners in different parts of the world. I have been unfortunate enough on several occasions, where irrigations of the uterus were resorted to on the supposition that they were indicated to correct nascent trouble, to throw my patients into a violent state of nervous perturbation. I have seen the system thrown into a depressed condition approaching collapse, and I think the younger members of the profession entering upon obstetric practice should be cautious about resorting to measures of this kind.

Dr. E. S. Lewis, of New Orleans (by invitation).—I beg you to

allow me to look on and listen rather than to participate in this discussion on the admirable papers which we have heard. The subjects have been so thoroughly treated by the writers and by those gentlemen who have discussed the papers that I have very little to add. I might, however, in connection with errors in diagnosis in abdominal tumors cite a case that I related to two of the members while coming from Washington to Richmond—an error in diagnosis for which I performed an operation before the medical class at New Orleans last winter. I supposed that I had to deal with a small ovarian tumor, but which, after the abdomen was opened, turned out to be a retroverted gravid uterus. The uterus was in a peculiar condition. I have never seen it so elongated in a pregnancy of about six weeks to two months. Fluctuation of the tumor was evident, and I felt satisfied at first that the case was not one of pregnancy, and as a further precautionary measure introduced a sound, when I thought I could distinctly feel the fundus of the uterus. The patient had had no suppression of menstruation, but for quite a long time she had suffered from various neuroses, and I attributed it to the presence of the supposed ovarian tumor. Upon opening the abdomen, introducing my hand, and lifting up the tumor, I found it to be the body of the uterus. I closed the abdomen, the patient made a satisfactory recovery, subsequently went to term, and has been delivered of a living child.

Dr. Frank D. Thompson, of Fort Worth.—It seems to me that there is one point connected with this subject upon which we need further light, and that is how long after a man has contracted gonorrhea should he wait before having intercourse with a woman? This question appeals especially to married men. We know that we have a great many cases of gonorrhea occurring in men of families. What are we going to do with these cases? We have before us all the ills and evils that arise from gonorrheal infection, and how are we going to treat these men? How long shall we tell them to abstain from sexual intercourse? These are questions that ought to be discussed more fully and definitely by the authors of papers, as well as by those those who have given the subject study.

Dr. L. S. McMurtry, of Louisville.—I do not know that I can add anything of importance to what has been said. The subjects under discussion have so often been debated in medical societies and by this Association that I think if nothing further was said there would be a thorough consensus of opinion in regard to them. Dr. Hall's paper, like everything that emanates from his pen, is exceed-

ingly practical, and embraces the views of the practical surgeon from that standpoint. He has presented the subject in a forcible manner and in such a way that no one can take issue with him. His paper brings up a number of collateral points which have been alluded to by the preceding speakers, and which are of interest. We have been so long dealing with the operative treatment in the cure of cases of suppurative pelvic inflammation that very little attention has been given to the feature of the subject presented by Dr. Hall, and that is its prevention. I must say, however, that some of the views which are thrown out as possibilities in regard to gonorrhea and its relation to marriage seem to me to be impracticable, and will never be enforced until the millennium is reached.

With reference to the paper of Dr. Dorsett, which I did not have the pleasure of listening to, I judge from the discussion that it related to the diagnosis of intra-abdominal diseases, which is certainly a very important subject. Mistakes in diagnosis have been demonstrated to occur in the hands of the most skilled and experienced operators. We all recognize the possibility of such errors. One of the gratifying things, too, is that surgeons are not now subjected to the severe criticisms that they were at an earlier period on account of errors in diagnosis. Furthermore, when operative surgery of the pelvis was introduced, the very best men in the profession were severely criticised by the laity, and by the profession at large oftentimes, for mistakes in diagnosis that we all recognize now as readily occurring in the very best hands. In this connection the only point I desire to allude to is the exploratory incision as a diagnostic resource. The value of this resource is thoroughly appreciated by all of us; but in certain places it seems evident that those views that have been expressed on the floor of the Association have not been recognized generally by the profession, and exploratory incisions are now made that ought not to be made. As Dr. Carstens, in his practical and very forcible manner, has said, an exploratory incision ought not to be done until all other resources have been exhausted. To accept as a dogma in practice that in obscure cases of pelvic disease it is legitimately proper to open the abdomen is going too far. It is not justified. A high order of skill ought to be utilized, and, unless there is serious danger to life, a diagnostic step so serious ought not to be undertaken. There was an impression that went out, which was unwarranted by operators in this country, that in cases of obscure pelvic disease it was judicious and proper and legitimate to open the abdomen. That is altogether wrong. I recall a case that I shall never forget, as it made a deep impression

upon me. The case was that of a young married woman who had suffered severely at her menstrual periods. I do not know what the indications were for operation, but an exploratory operation was made for dysmenorrhea. Such operative measures are a reproach to legitimate pelvic surgery. Such associations as this should call attention to the fact that the field of legitimate exploratory incision is a very limited one, indeed, and the idea that in any obscure case of pelvic disease it is legitimate to open the abdomen should be protested against on all occasions.

A word or two in regard to the incision, whether it is made through the parietes or through the vault of the vagina. Since French methods have penetrated American surgery it has been generally advocated that it is a simple procedure to explore the pelvis through the posterior cul-de-sac—through the vault of the vagina—but it is in my judgment quite as dangerous as the other route. Of course, there are some operators who operate with more ease through the vault of the vagina than through the abdominal wall, and however easy it may be to cut into the abdomen as a diagnostic resource, it should be protested against except in very rare cases.

Dr. L. H. Dunning, of Indianapolis.—I wish to say a few words with reference to the exploratory incision. I am in hearty accord with the remarks made by Drs. Carstens and McMurtry, but I wish to carry the point further than they regarding the cautions that are needed to surround the exploratory incision. I would extend the method of exploration further than is generally done by abdominal surgeons. The sentiment which prevails at the present time regarding the application of the exploratory incision is that the opening in the abdominal cavity should be a small one, so that one or two fingers may be introduced and the cavity explored. Those of us who are actively engaged in abdominal and pelvic work know very well that we can obtain very little information from an exploratory incision that will admit of the introduction of only one or two fingers. If the case will justify opening the abdomen at all, it will justify a larger abdominal incision, provided we do not find immediately what we believe to be a pathological condition. I consider this a matter of vital importance, because of some errors I made in my early practice and of some light which I have obtained in my later experience. For instance, I will cite a case of obstruction of the bowels which fell under my observation. The obstruction had existed for a long time until we thought an operation was absolutely necessary, and yet, after opening the abdomen below the umbilicus, we were unable to find the

source of obstruction. Possibly some would have attributed the extreme distention to septic paresis, and abandoned the operation. But by extending the incision some distance we found in the upper portion of the jejunum an opening in the mesentery which permitted a loop of the intestine to run through, and this obstructed the bowel.

Another case which fell under my observation was one which presented symptoms of sepsis, and in which there was a large fibroid tumor. It was supposed that a suppurating ovary was coincident with it. An operation was made for the removal of the tumor. No suppuration was found ; the fibroid was removed, and no further exploration of the abdominal cavity made. Three or four days later, sepsis persisting, the abdomen was reopened, and an abscess was found in the right inguinal and lumbar regions. It was a post-peritoneal abscess. Dr. Cordier related to us in coming down on the train a case of diaphragmatic hernia that was overlooked by an exploratory incision which was made below the umbilicus. The only point I wish to make is, that if there is any condition found present justifying exploration, we are warranted in making a thorough exploration of the whole of the abdominal cavity, if we do not readily find the pathological condition by a small opening.

Dr. A. H. Cordier, of Kansas City.—You will remember that quite a number of papers have been read in the last year by men who should be honest in their expressions with reference to abdominal and pelvic work. These papers have been read before large audiences of general practitioners, who were possibly in the majority on the side of conservatism in abdominal and pelvic work. They were read by men of national and international reputations, and have done a great deal of mischief over the country. I was especially interested in that part of Dr. Duff's paper in which he refers to the importance of being honest in our work. We should place ourselves on record as equally honest with anyone engaged in the general practice of medicine. Many of you doubtless recall a picture that was sent around as an advertising dodger, with a physician sitting at the bedside and an infant lying down, illustrating the great responsibility that is placed upon the attending physician when he engages in this profession. That applies with equal force to those who are engaged in surgical work for the preservation of human life.

As regards diagnosis, I have held radical views with reference to the possibility of making a diagnosis in intra-abdominal conditions. I believe in 80 per cent. of the cases a diagnosis can be made by painstaking and careful efforts. If the surgeon fails to make a diag-

nosis before operation, he will also fail after making a small exploratory incision and introducing his fingers into the abdomen. He will fail in making a diagnosis because, after the specimen is removed and in his hands, he will have to resort to the assistance of a pathologist or microscopist. Of course, this is not always the case, but in the great majority of cases I am sure a diagnosis can be made. If we look back over our methods when we have failed to make a diagnosis, and our manner of obtaining the histories and making examinations of patients, we will find that we have been faulty in our technique; that we did not ask questions along this line, or that we did not carry our investigations far enough in some one direction; we did not resort to an analysis of the fluids escaping from fistulous openings. All these things considered bring us nearer to an accurate diagnosis.

With reference to the case of diaphragmatic hernia alluded to by Dr. Dunning, the diagnosis in this case was only made post-mortem. As I look back over the case, I am free to confess that I was extremely faulty in my examination of the man. He was taken with pain in the region of the umbilicus, but did not call in a physician at once. Shortly afterward he was taken with fecal vomiting; pulse 54. This was Monday morning, but I did not see the case until Monday afternoon. The man was very restless. The attending physician thought he had acute intestinal obstruction, which I accepted, and without making an examination of the patient, which is a wrong thing to omit, resorted to an operation, not an exploratory one in the true sense of the word, but it turned out to be exploratory because it failed to find anything. I ran my finger along the intestine from one end to the other, from the appendix to where the jejunum passes down under the transverse colon. A gallon of water had been injected into the colon. I did not find any omentum, or peritoneum. I slipped my hand up over the liver to the under surface of the diaphragm. It did not seem possible that the man had a diaphragmatic hernia, and I reluctantly closed the abdomen without finding the source of the symptoms. After closing the abdomen I looked at the gums to see if I had not operated on a case of lead-colic. At the post-mortem examination, in extending the incision upward and downward, I noticed an absence of the stomach in the abdomen. The man did not seem to have any stomach. On carrying the hand well up under the diaphragm the stomach disappeared through an opening to the left of the median line. The entire stomach was in the pleural cavity. The splenic flexure had gone up with it, and the spleen itself also was in the pleural cavity, as well as fifteen inches of the ascending and transverse

colon. The man had vomited fecal matter; the feces had passed up from the pyloric end of the stomach into the diaphragmatic opening and into the pleural cavity; came through the cardiac end of the stomach and up through the esophagus. The constriction was not complete. A positive diagnosis could have been made in this case, if a thorough and careful examination had been made in the first place. When we fail to make a diagnosis, let us go back over our methods and see if they are not faulty in referring to the rules laid down in these cases.

Dr. Edwin Ricketts, of Cincinnati.—I want to say that there are cases, and not a few, in which, with all our boast of knowledge of diagnosis from the outside previous to opening the abdomen, we cannot tell what is on the inside, and many times we do not know after we have opened the abdomen. A lady consulted me last January who had carried a tumor for seventeen years. She was forty-three years of age. I examined her carefully and made a diagnosis of ovarian tumor. The woman, with the tumor, weighed 175 pounds. She presented every indication of an ovarian cyst. There was loss of flesh of the arms and of the legs, a peculiar expression of the face and of the umbilicus. By palpation I could get no hard tumor, and yet upon opening the abdomen and removing the tumor and its contents, it weighed ninety-five pounds. Thirty-five pounds of it were solid and sixty pounds fluid. I did not have an ovarian cyst, but a fibro-cystic tumor. I think I was as careful in my examination of the patient as possible, and yet I was mistaken. I was mistaken even up to the time I tapped the tumor and had removed the fluid. I found the solid portion toward the spine, and the secret was then easily explained. We are not so spot sure as to diagnosis on the outside, so let us be candid with each other. We all make mistakes.

In regard to the paper of Dr. Hall, who is always able to give us something very good, during his absence this summer on a vacation I had an opportunity of being called to see a patient that would have been his had he been at home. The lady was about twenty-three years of age, had been married for a year, and I found on closely questioning the husband that he had had gonorrhea; furthermore, that she had had an abortion, not induced, at the third month, followed by septic peritonitis. She had been in bed for sixteen weeks when I saw her, with an abscess pointing in the line of the iliac region. This was opened, evacuated, and packed with gauze, and the patient was getting along very well according to last reports. In regard to this class of cases, at a certain time in the progress of the disease we will do a

better operation if we open the abdomen at once, and not wait until the disease reaches an extreme point. Then the recovery is more satisfactory than if the patient is permitted to go on for sixteen weeks and suffer. In other words, there is a time for all things; there is a time for the education of the laity in regard to these cases, for instructing patients and family physicians that it is better to take the chances in opening from the outside rather than to go through the peritoneal cavity from below.

Dr. McMurtry.—If I may be pardoned for detaining the Association a moment or two, I would like to say that I think my friend, Dr. Ricketts, entirely misconstrues the remarks that have been made in regard to the accuracy of diagnosis and the necessity of precision in this respect, and I think while it may appear that we are upon opposite sides, an analysis of the remarks made will show that we agree fully, as those who have already participated in the discussion have related instances of mistakes in diagnosis, among them Professor Lewis. I think Dr. Ricketts did not make any mistake in diagnosis in the case related. I think he made as correct a diagnosis as anybody pretends to make. He made a diagnosis of abdominal tumor that was fluctuating, and no operator pretends to be able to distinguish between a fibro-cystic tumor of the uterus and an ovarian cyst. The point he makes we all concur in, that an exploratory incision should not be resorted to in cases where life is not endangered nor until all ordinary means of diagnosis have been exhausted.

The President.—Dr. McMurtry failed to include in his classification tuberculosis simulating ovarian cystoma. He has reported such a case. I agree with him that Dr. Ricketts cannot criticise himself, nor can operators of prominence, men who are operating daily, for the diagnosis he made in that particular case. An error made by all is that cystiform degenerations are not very common. It is a cystoma, whether it be a cystiform degeneration of a fibroid, or a cystoma with irreducible contents perhaps half its weight.

Dr. Edmund F. Fish, of Milwaukee.—I did not have the pleasure of listening to the papers that have been read, but judging from the discussion I believe I grasp the points that were brought out. While I do not believe in promiscuous exploratory sections, I recall several cases, and one particular case where I am satisfied an exploratory incision saved the patient's life. Some time last January I was called to see a patient who had been under the care of a specialist for syphilis, and had been taking mercury and iodide of potassium in large doses. On reaching the house I found her sitting on a chair, with her thighs

flexed on her abdomen. She complained of excessive pain in the left iliac region, and it was impossible to make a satisfactory examination. She was placed on the bed; I attempted an examination, but could not make out anything because the abdominal muscles became so tense. The pain was confined to the left side and low down. She had been in this condition for thirty days. She was a thin, ill-nourished woman and had been losing ground for this length of time. It was impossible to make a diagnosis, so I used suppositories of opium, belladonna, and iodoform, hot douches, hot applications, instructing her when leaving the house to let me know in a day or two how she was getting along. A week later I found her in the same condition. They told that me after the first visit she had the following day arisen and had superintended her household duties to a limited degree. This time the pain extended from the left into the right iliac region. As the abdominal muscles were very tense I could make out nothing; an anesthetic was refused; hence I could do nothing more than to treat her medicinally. She went on in this way for another week, her stomach retaining nothing but opiates and peptonoids. At this time I refused to see the case again unless allowed to administer an anesthetic, and, if necessary, open the abdomen. Finally they allowed me to take her to the hospital, and there we attempted rectal alimentation. This did not benefit her, and she continued to lose ground. She was finally anesthetized, placed on the table, and carefully examined by myself and two other physicians, but we could not make out anything. The pulse at this time was 140 and temperature 102°. She was so reduced that we hardly knew whether to resort to an exploratory incision or not. However, we finally decided to open the abdomen, when we found the left tube and ovary normal, the right tube normal, but the ovary somewhat enlarged and cystic. I took out this ovary, and the absurdity of the procedure struck me as soon as I had removed it. We could not find anything in the pelvis. Some one suggested looking at the appendix. I then exposed the appendix and found its distal two-thirds filled with fecal matter. It was removed, the abdomen closed, and the patient made an uneventful recovery. There was no rigidity nor tenderness over the ileo-cecal valve. The tenderness started in the left iliac region, extended to the right, and the operation revealed appendicitis. The peritoneum was only slightly congested.

Dr. Richard H. Gibbons, of New York (by invitation).—Many of these cases are due to puerperal contamination, and I believe often to laceration of the cervix, as Dr. Emmet has long since pointed out. In puerperal cases and likewise in cases of abortion, Dr. Emmet at

first, and many others have since agreed with him, held that laceration of the cervix took place in abortions. I believe that was due to the fluids which came from the amniotic sac, and the cervix not being fully prepared for dilatation became lacerated or ruptured. I believe these are the places where the poison first enters. I further believe that we should follow the teaching of Emmet to examine the cervix and vaginal canal carefully, keep the uterus cleansed, and then let it alone, especially where there has been blood-poisoning existing for several days. If we irritate the mass, so to speak, in the uterine cavity, we merely add fuel to the fire. In these cases the proper thing to do is that which Dr. Price has taught us, namely, to open the abdominal cavity, wash out, and be satisfied. Drainage, however, should be kept up for a sufficient length of time, and then later on we can deal with the appendages. We should not disturb the uterine cavity. So much for that class of cases.

In regard to Dr. Hall's paper, I fully accepted, and did at the time —although a young man—the teachings of Noeggerath, who gave us the keynote to the class of infection produced by gonorrhea. I believe that of a hundred people who have gonorrhea, few of them will recover from it, unless we resort to extreme measures. The way to prevent infection of women is to increase the calibre of the urethra by dilatation, regardless of what it may have been, and in that way begin the treatment of chronic gonorrhea. The patient should be freed from disease entirely before he is allowed by a physician to get married.

In regard to the diagnosis of intra-abdominal diseases, as well as in all other diseases, there is not one symptom that is pathognomonic. Six or eight years ago everybody referred to the McBurney point, and it was stated that there was no longer any excuse for the general practitioner not recognizing that point. I wrote a paper on the McBurney point at that time, which was published in the *New York Medical Journal*. I received letters from all parts of the world regarding it. Some of the writers stated that the McBurney point was utterly useless as a symptom in the diagnosis of intra-abdominal diseases, and particularly the disease known as appendicitis. Dr. McBurney himself only relies upon it to a certain degree. It is natural enough in cases of appendicitis to find at the McBurney point extreme tenderness on pressure; if you have an inflamed appendix, you will get intense pain at any point where you have a focal inflammation. This is especially diagnostic of appendicitis, if along with this pain you find other symptoms. I opened the abdominal

cavity on one occasion against my will, at the earnest solicitation of not only the attending physician, but the people themselves, and I found a normal, flat, but reddened appendix. I believe all appendices, rounded and distended, are diseased.

With reference to the point of not being able to make a diagnosis in some cases, I will say that I sent a case to Dr. Price last spring in which I had made a diagnosis of fibroid tumor of the uterus, with the possibility of there being an old fetus within the cavity of the uterus. At the invitation of Dr. Price, I went on to Philadelphia. He opened the abdomen of this woman and removed a tumor which she had had for some seventeen years. It was the most magnificent pathological specimen I have ever seen. It was a sarcoma of both ovaries fused into an enormous mass. This woman was refused operation by some forty physicians, two of them being the leading practitioners of Philadelphia. She is now perfectly well.

Dr. H. W. Longyear, of Detroit.—There is one point that was not touched upon in the papers, and that is the importance of educating the laity as to the dangers of gonorrhea. I think we should begin to place the responsibility upon them. They should be given the necessary knowledge on this subject. This education should begin in our public schools and the information imparted by teachers who are capable of pointing out the dangers of this disease.

Dr. Duff (closing the discussion on his part).—I do not think it necessary to take up very much of the time of the Association in a further discussion of the points which were brought out in my paper. I believe we live in an educational age, and that as a profession we should not be behind the times in giving the laity an opinion. It is very well known to all of us that pretenders in medicine are talking through the public journals to the public upon matters of this kind and in a manner which is certainly detrimental not only to the people themselves, but to the best interests of the medical profession. Therefore my heart and soul are in the work of this general education of the masses. On the other hand, I believe that portion of the profession represented here is honorable. They are not seeking notoriety; they are not seeking a desire for operations alone, but are seeking to do good to humanity, and for which they are sometimes unjustly criticised.

With reference to the danger of abortions being greater after the third month than prior to it, I cannot agree with that statement. I am speaking from my own observations. I have seen very much more ill from criminal abortions before the third month than afterward, but I admit that I see a great many more which occur before

the third month than after it. We know the uterus will not empty itself as well at that time as it will subsequently.

I hold in my hand a paper which was sent to me by the internes of the hospital in Pittsburg, and it relates to a case in which I made a mistake last week. On Monday evening a gentleman, a railroad employé, was taken sick. He consulted a physician who gave him some common remedy, after which he left the physician's office. Tuesday he attempted to work, but could not. He then visited a physician and complained of pain in the abdomen, also of general malaise and debility. His temperature was 100°. Appedicitis was suspected. The pain became a little more intense over McBurney's point. The abdomen was tympanitic. On the following day the patient was again seen and the symptoms were those of the previous day, except that the temperature had now risen to 101°. I saw him with the attending physican at 11.30 P.M. and made a diagnosis of appendicitis; at the same time I suggested to the doctor in charge, as well as to several members of the staff who assisted in the operation, that the man had indications of other trouble than appendicitis. But I was confident that I found a fluctuating tumor. He was a man who, perhaps, weighed over 200 pounds, and had a good deal of adipose tissue. I made an incision parallel to Poupart's ligament, and found a pus-sac. I cleaned it out, inserted a Mikulicz drain, and put him to bed, feeling reasonably certain that he would get along well. But after leaving him he died, and the paper I hold in my hand contains the result of the post-mortem examination. He had volvulus, and there were old inflammatory adhesions producing constriction of the bowel as well. I was therefore right in my surmise that the man had other trouble in connection with appendicitis. One peculiarity in the case was the short time he had complained of symptoms. He had never had anything wrong with him before. This is a point well worth keeping in mind in doing operations for appendicitis.

Dr. Dorsett (closing the discussion on his part).—I feel very comfortable because I find that I have a good deal more company than I expected to have. Several of the members are on my side. We have all made mistakes. There is one thing that I would like to speak about, and that is the point I tried to make in my paper, that an exploratory incision should not be taken as an evidence of ignorance, as it is sometimes, and the remarks made by Dr. Cordier with reference to not exploring far enough in the case which he cited, as well as those made in relation to the case cited by Dr. Duff, certainly would tend to show that if the explorations had been more thorough the termina-

tion of these cases would probably have been different. The only point I thought would be criticised in my paper was that of exploratory incision. It should not be taken as a matter of ignorance, bnt as a means of diagnosis. I do not mean to say by that it should be done immediately. I believe that it ought to be the last thing that is done, after we have used every other means possible, such as bimanual and abdominal palpation in examining patients in different positions. Then, when we are at a loss as to the diagnosis, I think an abdominal incision may be called for.

In the case related by Dr. McMurtry, it seems to me there was a mistake in the technique of the operation, in that it was not exactly aseptic.

Dr. Hall (closing).—I think the paper of Dr. Duff is a good one, and that it will exert influence in the direction suggested by the essayist. The fact, mentioned by one of the speakers, that gonorrheal infection is very much more frequent in some lines of practice than in others, will not be denied. I mnst take issne with the gentleman in the assertion that these cases all occnr in persons in the lower walks of life. He conveyed the impression that the disease was much more common in clinical practice than in private practice. It does occur in all walks, and a vast amount of suffering, due to the ignorance of the laity along this line, is what I asserted and contended for in my paper. If gonorrheal infection only caused 5 per cent. of pus-tubes, it would be even then worth while to raise onr voice against the infection and to warn the young men of the danger of gonorrhea. I have kept very careful record of my cases within the last few years. I read a paper last year before this Association along this line, and I almost feel ashamed for bringing up the subject again this year; but I received so many letters, some of which were congratulatory and others that were abnsive of my paper last year, that I thonght I would try it again. It is a very absorbing snbject; it is a serious matter to operate upon the wife of some prominent young bnsiness man for the pnrpose of removing suppurating ovaries and tubes, and it is sad to hear snch a patient say, "Doctor, I was well eight months before I was married." Five times within the last year I have taken out suppurating ovaries and tubes from the wives of intelligent, educated men, who had been well prior to marriage. The laity needs education along this line. If men knew the danger, they wonld postpone marriage a little longer. I do not stand alone on this subject. It is hard to get at the exact percentage of how many cases occur. Our duty is to educate the people. If we talk this matter over among onrselves, it will not be long before the laity will also be educated along this line. It

will do good through boards of health in the way of perhaps preventing the issuing of certificates of marriage. It will do good through other channels.

As to the danger of infection following abortion, I believe with Dr. Duff that the great danger is in the early months, and this danger does not come from injury to the cervix from abortion, but comes from retained secundines, and the remedy for that is to empty the uterus within the first two or three days. You will have no occasion to open the abdomen and remove a suppurating ovary or tube except in rare instances. If the suppuration is in the abdomen, then the remedy is to open the abdomen.

One word in reference to exploration: I believe when we make an exploration the incision should be sufficiently large to enable us to explore the cavity thoroughly and find out what is wrong. I do not say this in criticism of the case of Dr. Cordier. His case was a rare one, and one that would mislead any of us. I think he was very kind to give us the benefit of his experience in that case, but I want to insist that obscure cases in which we cannot make a diagnosis should not be denied an exploratory incision. They should not be relegated to the rear. They should have the benefit of a doubt, and we should explore and see if anything can be done.

MIXED TUMORS OF THE OVARY.

With Report of Case.

By WALTER B. CHASE, M.D.,
BROOKLYN.

Mixed tumors of the ovary have a peculiar interest attaching to them for the reason that their diagnosis is often difficult if not impossible. While a large single or multilocular cyst of the ovary or a large solid growth is usually easy to determine, a mixed tumor made up of single or multiple cysts and a solid growth would not be differentiated unless there was a variation in destiny or fluctuation discernible by palpation or percussion. The true nature of the neoplasm might, however, be apparent in large mixed growths or in those of smaller size in a patient with thin abdominal walls. The etiology of tumors as a whole is a matter of great importance, both in relation to their pathology and their treatment. The question as to what constitutes a tumor may be considered with profit in passing. The classical works of Warren and Senn, which reflect great credit on American authorship, make the literature of the subject a mine of wealth. Senn, in his work on the *Pathology and Surgical Treatment of Tumors*, treats this subject in a masterly and discriminating manner. He defines a tumor as a "localized increase of tissue, the product of tissue proliferation of embryonic cells of congenital or post-natal origin produced independently of microbic causes." He also points out the fact that true tumors never disappear, except by destruction or removal; that benign tumors always remain local, and that malignant tumors are disseminated by migration or transportation of their distinctive cells. It would, therefore, follow that permanency of an adventitious growth is evidence of true tumor formation, and that chronic inflammatory enlargement, as tuberculosis, syphilis, and glanders,

must be exeluded from the list of tumors. As to the histogenesis of tumors (following Senn), it may be affirmed that a tumor never originates *de novo*, but is always the produet of tissue proliferation from a matrix of embryonie cells, and that the character of the tumor depends on the stage of arrested cell-growth and the embryonic layer from whieh the matrix is derived. The division of embryonic tissue into epiblastic, hypoblastic, and mesoblastie lays a broad and comprehensive basis for the study of tumor growth and its differentiation, remembering always that no transmission from one type to another oeeurs, though it is admitted that a benign tumor may be transformed into a malignant growth by a development of cells of embryonie or post-natal growth already present.

Here, then, is the groundwork in brief, brought to light by biologie and histologic study, on which to rear the strueture of a rational and seientifie pathology. The applieation of these prineiples of embryonie eell-growth simplifies and elucidates the problem of tumor formation. It is a logical inferenee that if papilloma, adenoma, cystoma, or eareinoma develop in the ovary it arises from the epiblastie and hypoblastie embryonie eells; if fibroma, sarcoma, osteoma, neuroma are found, the mesoblastie layer of embryonie cells is the matrix of sueh benign tumors and sareomata, whieh represent the connective-tissue types of true tumors; and when dermoid cysts develop, their origin is from the several layers of embryonie structure—the epiblast, the hypoblast, and the mesoblast. The blending, infolding, or displaeement of these several structures constitutes true dermoids, and belong to the group of teratomata. The elinical history of the development of tumor growths might with profit engage our attention, but ean only be referred to. The origin of these embryonie eells and the time of their development bear a eonstant and important relation to the character of this eell proliferation. If the tumor matrix is made up of embryonie cells of the lowest development, there is greater liability of the formation of a malignant tumor than if from a matrix representing embryonie cells eapable of tissue development of the highest physiologic type. One pertinent fact should never be lost sight of—that benign tumors originate as benign tumors, and malignant growths as malignant. An important point in the differential diagnosis of benign and malignant tumors is that benign tumors have a limiting eapsule and grow slowly, while malignant

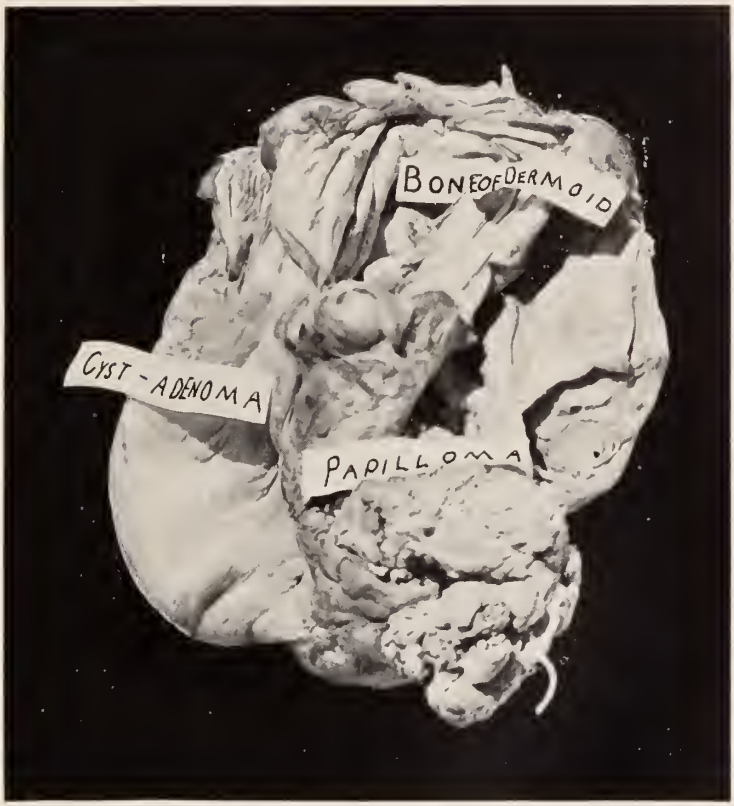
tumors grow rapidly and possess no such capsule. The behavior of latent embryonic cells—under changed conditions—resulting from traumatism, irritation, or varying blood supply, should not be lost sight of.

So, too, the normal or diminished resistance of adjoining structures has a determining influence in tumor growth. An appreciation of the conditions of pathologic development and the marvellous uniformity of the operation of the law of proliferation in normal and pathologic development aids materially in simplifying the genesis of tumor growth, whether benign or malignant, and, when focussed in the glass of modern histologic research, yields the composite picture of mixed tumor formations. Cystic disease of the ovary is of such common occurrence as to be of interest in this connection. After much study Bland Sutton says he never observed a "cyst in the corpus luteum" to give rise to tumors which could be perceived during life; he has seen such cysts on the surface of the ovary, though they never caused inconvenience. It was formerly believed that cysts originating in the parovarium were never larger than an orange, but Bantock has observed those which contained several pints. It is the generally accepted belief among pathologists that retention cysts in the ovary never attain a size larger than a hickory-nut. Large cysts of the ovary are not retention cysts, but, like all other true tumors, their origin is from a matrix of embryonic cells. An apparent exception is mentioned by Senn: when "in a Graafian follicle a matrix of embryonic epithelial cells should exist, we can readily understand that the follicle would become the cyst-wall while the matrix would furnish the contents." The common form of large ovarian cysts is that of cyst-adenoma—a benign epithelial tumor. The difference and yet the close relationship between benign adenoma and papilloma is in the relation of the epithelial cell to the basement membrane; that in adenoma the basement membrane is in the alveoli of the parenchyma of the tumor, while in papilloma it is on the inside. Dermoids of the ovary represent a true teratoma, and are a combination of the growth of matrix cells of the three embryonic layers—the epiblast, the hypoblast, and the mesoblast—which have by infolding, combining, or displacement developed in the same tumor. It would appear from what has been said that the genesis of simple and mixed tumors is divested of much that was mis-

leading and contradictory, and is reduced to a simple and rational basis. This theory, while simple and rational, clears up another disputed point in pathology—whether tumors are of local or constitutional origin and whether they are congenital. While giving proper emphasis to the fact that all tumors are of a local origin, it also demonstrates with great clearness that they are congenital.

The case I have to report is as follows: Mrs. B., aged sixty years, of English parentage, married but sterile, was operated on by me at St. John's Hospital, August 4, 1894. The abdomen was distended and tense, and a large cyst clearly outlined, which showed increased resistance in its lower right zone, which was suggestive of greater density. She had suffered pain for many years, and to escape suffering she sought operation. While for years she had been cognizant of an abdominal enlargement, the recent increase in size, which had been pretty rapid, dated back eighteen months. The tumor was composed of two separate cysts, the larger containing about two gallons of straw-colored fluid. The smaller cyst, which was attached to the right side of the larger cyst, contained rather less than a quart of yellowish-brown fluid, and in its walls were two plates of bone. In the walls of both cysts were numerous papillomata from the size of a small hen's egg to those scarcely perceptible to the naked eye. Some of the cysts containing the papillomata had ruptured through the lining membrane of the larger cyst and were found within its cavity, probably having been detached during the operation. From gross appearances it would appear at point of union of the two cysts that they had a common cyst-wall, but microscopical examination would probably show the two cyst-walls had coalesced. Dr. H. P. de Forest, pathologist to the Methodist Episcopal Hospital, reports as follows: "The larger cyst is a cyst-adenoma; the encysted tumors in cyst-walls, papillomata; and the smaller cyst, a dermoid—forming what may be regarded as a unique and rare pathological specimen."

FIG. 1.



Mixed tumor of ovary—adeno-cystoma, dermoid, papilloma.

Fig. 2.

Mixed tumor of ovary—adeno-cystoma, dermoid, papilloma. A, cyst not opened, containing papilloma; B, papilloma; C, cyst containing bone-dermoid.

TUBO-OVARIAN CYSTS, WITH INTERESTING CASES.

By ALBERT GOLDSPOHN, M.D.,
CHICAGO.

Although Blasius[1] gave the first description of a post-mortem specimen of tubo-ovarian cysts in 1834, he called it hydrops of the ovary rather erringly, as some more recent authors have done, as Bland Sutton[3] and G. C. Freeborn.[4] Sutton calls only such cases tubo-ovarian cysts where a hydrosalpinx communicates, not by its abdominal ostium, but by a side opening, with some ovarian cyst or follicle.

The correct name given to these formations was suggested in 1853 by Richard,[2] who spoke of "kysts tubo-ovariens" in describing a number of post-mortem specimens, of which he claims to have seen eleven cases, but adequately describes only four. In addition to these he also speaks of some clinical cases with profluent discharges. But in the absence of a specimen obtained by autopsy or operation they are not conclusive.

By a tubo-ovarian cyst we mean a non-purulent sac whose walls are composed, in variable proportion, of the walls of the Fallopian tube and those of some cystic ovarian or parovarian formation, with the coalescence of two or more cavities—at least one from each—into one by a free communication. The fluid-contents of such a sac may be serous or hemorrhagic, or may partake, in variable degrees, of the qualities and characteristics of the fluid contained in true glanduar ovarian cystoma.

The fimbriæ of the abdominal ostium of the tube may be distinguished or not upon the inner or on the outer side of the ovarian portion of the sac, or they may have coalesced with other structures to form some portion of the walls of the united sac. The ovarian element in this formation can have originated from a

hydropic Graafian follicle, a cystic corpus luteum, from the primordial glandular ducts of Pflüger in the ovary, or from the parovarium.

The minimum requirements to be met in recognizing a tubo-ovarian cyst are: (1) to recognize the participation of the tube, which is easy enough from its position and connections; (2) to prove the participation of the ovary by demonstrating some ovarian tissues in the wall of the sac; (3) that their cavities are united by some opening through which the mucous membrane of the tube is continuous with the lining of the ovarian cyst or follicle. Judged by this standard, I have been obliged, in making a review of the literature accessible to me, to reject a number of cases that are not adequately described or in which the above three features were not all present. Thus Bernier in his second article[5] publishes two cases as such, where in each case a hydrosalpinx was soldered to an ovarian cyst without an opening between their cavities. These might have become actual cases later, but they were not such when observed. In the cases of Labbe,[6] Anderson, and Beale[7] the ovarian involvement is not proven. And the existence of a tumor and profluent discharges in a number of cases, without an autopsy, proves nothing.

The total number of authentic cases that I have been able to find in the literature is thirty-eight, by twenty-five different authors, as follows: Blasius,[8] Henning,[9] Hildebrandt,[10] Runge and Thoma,[11] von Ott,[12] Koetschau,[13] Thoma,[14] Reboul,[15] Lober,[16] Schentauer,[17] Goodhart,[18] Griffith,[19] Doran,[20] Reed,[21] and Bovée[22] have each one case; Rokitansky,[23] Gottschalk,[24] Schramm and Neelsen,[25] Wachsmuth,[26] and Freeborn[27] each describe two cases; while Cullen,[28] von Rosthorn,[29] and Olshausen[30] each report three cases, and Richard[31] four cases in 1853. The latter claims to have seen eleven cases altogether, as post-mortem specimens, but does not adequately describe them. The first case of Freeborn, called by him, improperly, an ovarian hydrocele, after the sole definition of Bland Sutton, is a bilateral cyst, and could be counted as a double tubo-ovarian cyst if he had established the presence of ovarian tissues in the sac on the right side. Aside from this I have found only three credible cases of double tubo-ovarian cyst recorded, and my third case constitutes the fourth. Bland Sutton[3] calls all these formations ovarian hydroceles, except in the rare

instances when a hydrosalpinx communicates with an ovarian cyst, not by the abdominal ostium of the tube, but by some side adventitious opening. There is no reason for such a distinction.

My own cases are as follows:

Case I.—Mrs. D., aged thirty-three years; generally healthy since childhood, and menstruation fairly normal since her fourteenth year; married thirteen years; two children, eleven and seven years. Endometritis several years following second birth, then two years of health; one year before operation an attack of so-called typhoid fever lasting four weeks, from which she arose with a distinct tube-sac on left side and a continuous aching and sometimes lancinating pain, becoming unbearable at time of menstruation. This patient had a profluent discharge two weeks before operation, which afforded her such a relief that she doubted the need of an operation; and on the day before operation, after making the vagina dry, twenty to thirty cubic centimetres of a watery liquid were found in it after bimanual palpation of the cyst. Objectively, find an otherwise healthy woman, with uterus little enlarged, tender, in normal position, but motility impaired; on its left a fluctuating, tender, immovable sac, size of small fist, with the general characteristics of a hydrosalpinx, but located very low down; ovary not distinguishable; adnexa right side normal. Diagnosis: Hydrosalpinx sinistra.

January 21, 1892, abdominal section and removal of left appendages. Normal recovery and good health since then. The cyst was removed without rupture, was the size of a medium fist, and was adherent over most of its surface. When the ligature had been removed from the uterine end the fluid in it could be expelled there by compressing the cyst. On its upper surface it could be enucleated, but from below it required tying off and removal of a section of broad ligament with it. The specimen was of a bluish-white color, had mostly thin membranous walls in which little or no muscular fibre could be seen. Dr. Byron Robinson, who assisted me, demonstrated it at the Chicago Gynecological Society[32] as follows:

"The cyst has the shape of a retort. The ovary covers the abdominal end of the tube like a shield, and is spread out so thin that one can see through it. The tube has no trace of fimbriæ left, and nearly every trace of muscle in the ampulla has gone. It

contains some four ounces of straw-colored fluid, which has a substance that acts like albumin and may be called paralbumin. In the fluid are found ciliated but mostly non-ciliated cells, hemoglobin crystals, and a jelly-like substance." This specimen I have lost.

Case II.—Mrs. R., aged thirty-six years; acute rheumatism at fifteen; menses at thirteen, and regularly monthly since then when not pregnant; married from her twentieth to thirtieth year; a normal labor at twenty-two, and a miscarriage of five months at twenty-three; two years later in hospital for pelvic inflammation during three months; since then constant lingering pelvic ailments, and always marked pain on the left side; frequently syncope after coitus.

Status præsens. Patient generally healthy and of sound body aside from pelvic conditions. Uterus in normal position, large, hard, tender, and partly movable. On left side a distinct cystic body, size of small apple, connected with the uterus, but not movable, taken to be a hydrosalpinx. On right side a pipe-stem tube and a hard, nodular, enlarged, immovable, and extremely tender ovary are felt by bimanual palpation.

February 27, 1894, abdominal section. Removal of tubo-ovarian cyst from left side and a thickened tube and sclerosed ovary with multiple cystic follicles from right side. Very smooth convalescence. Highest temperature 101°. The cyst contained a clear, watery fluid that could be expelled from the uterine end when the ligature was removed. The outer half only of the tube has partaken of the expansion. The muscle in its walls has faded away gradually into a membranous cyst-wall of a bluish-gray color, which is translucent in many places and has the size of a small orange. At the most pendent portion of this cyst it rests in an expanded firmer body of non-membranous tissue which covers about one-sixth of the surface of the cyst and at its edges gradually fades into the membranous portion. By careful macroscopic examination, in the fresh state, Graafian follicles and other ovarian structures could be seen in this body of tissue. The mucous membrane of the tube is continuous with that of the cyst, but no trace remains of fimbriæ within or without the cyst-walls, nor is muscular fibre apparent in the cystic portion. The uterine end of the tube was readily permeable and the cyst was easily distended with air through it.

Case III. *Double Tubo-ovarian Cyst.*—Mrs. L., aged thirty-two years. A robust woman aside from pelvic disorders. Menstruation began at eleven years of age and recurred irregularly every one to three months, attended with severe premenstrual pain, until she was about nineteen years old, when the irregularity disappeared but the dysmenorrhea continued. At that time (nineteenth year) she had been married three years, during which time, she says, she received an introduction of a slippery-elm tent into the cervical canal nearly every non-menstrual week. Soon after this treatment and the irregularity of the menstruation subsided, she experienced a new and alarming symptom which was associated with the regular dysmenorrhea until her thirtieth year. Approximately every three months, and during the existence of her premenstrual pain, she experienced a copious watery discharge, so that she was often disappointed to find that it was not the menstrual flow, which would usually follow during the next few days. This outpouring of water was so great that it led her and her friends to fear that she had dropsy of some kind that the doctors did not detect, and she took decoction of juniper berries and Carlsbad salts during March, April, and May of each year to counteract the disease. With cessation of these discharges, two years before operation, her troubles grew in the form of menorrhagia with severe pain, and constant pain in right inguinal region, bladder, rectum, back, stomach, and chest.

Examination. Find uterus about normal size, crowded into hollow of sacrum and to the right. A globular cystic tumor, size of a child's hand, fills the upper pelvis on the left side and extends into the abdomen; is not tender, slightly movable, and cannot well be circumscribed. Deep in the true pelvis, to the right of the displaced uterus, an ovary with cystic attachment, size of an egg, can be felt, extremely tender and immovable. Diagnosis: Left side, ovarian cyst; right side, septic tubo-ovarian conglomerate.

Abdominal section and removal of both September 11, 1895. Smooth recovery. The larger tumor contained about a quart of dark-gray mucoid fluid, which was thrown away as soon as it appeared to be an ordinary ovarian cyst. The smaller mass on right removed *en masse*, after a number of circumventing ligatures in the broad ligament, was recognized as a tubo-ovarian cyst at once. The convoluted tube has walls thickened like a pipe-stem

near its uterine end, from whence its lumen also grows larger gradually until ten centimetres from its beginning, when it expands, by an aperture large enough to admit a finger, into a cavity half the size of an egg, with membranous walls in its upper half, the lower being a cup-like structure into which the enlarged ovary at the bottom has been converted, with sides tapering into the membranous parts of the sac. No fimbriæ are recognizable, but numerous striæ of tubal mucous membrane extend continuously from the lower tube-wall outward upon the wall of the sac beyond the tubal opening. The larger cyst from the left side is globular and has a diameter of thirteen centimetres. It is surrounded two-thirds of its periphery, over its vertex, by the rather uniformly enlarged but flattened pipe-stem-like tube, whose length from uterine cornu to its opening into the cyst-cavity is twenty-five centimetres. The upper segment of the cyst and the tube are covered by a common serous membrane, which constitutes a short mesentery for the inner half of the tube upon the cyst-wall; but in the outer (abdominal) half of its length it very gradually merges into the wall of the sac beneath it, in a manner as the ureter passes into the bladder, until its lumen opens by a valve-like aperture, having a free edge for more than half its circumference on the inner side of the sac. The tubal mucous membrane is continuous with the lining of the cyst over this spur, and three fringy tendrils hang out of this opening into the cyst-cavity from one to three centimetres. The larger portion of the cyst-wall is from one to three millimetres thick, is wholly composed of fibrous and connective tissues arranged as a network. There is no mucous membrane lining it, seemingly, and on two small spots examined microscopically the lining membrane had degenerated to a layer of granular material, usually about fifty micromes in breadth, in which are granules of black pigment. The lower and inner segment of the cyst-wall, where it had to be tied off from the broad ligament, is from one-half to one and one-half centimetres thick from fibrous and nodular structures in it that are remnants of the expanded left ovary.

These forty-one cases are certainly only a small part of the total number that might be counted if all ante- and post-mortem specimens were thoroughly examined and recorded, and even if all that have been seen were recorded. My three cases constitute at least

10 per cent. of all the non-purulent tube-sacs that I have extirpated ante-mortem, the purulent tubo-ovarian conglomerates and abscesses being the great majority.

Anatomically the following is of interest: The general outline of tubo-ovarian cysts is that of a retort, as all authors say. The opening by means of which the tube communicates with the cyst-cavity is usually not the abdominal ostium of the tube proper, but corresponds approximately to the point in the tube lumen where the isthmic and ampullar portions of the tube join; and it becomes flexed by reason of its shorter attachment to the broad ligament there, and by the influence of contracting bands or thickening of peritoneum, united with the effect of gravitation upon the expanded ampulla or cyst attached to it. When this is not borne in mind—viz., that the cystic portion is partly made up of the ampulla of the tube—it is easy to mistake some frayed-out strands of muscle from the wall of the ampulla as remnants of fimbriæ in the cyst-wall. Again, at this point of flexion of the tube, at an angle more or less acute, a spur is formed, which, being of flaccid material, acts like a valve certainly in many cases, and saves the inner half of the tube from the expanding effect of the cyst-contents, and may prevent a profluent discharge even when the uterine ostium of the tube is open. A number of authors found a membrane-like valve at the tubal opening into the cyst. Now, any such valve or other anatomical feature that is intermittent in its action and causes an intermittent outflow of cyst-contents has a practical bearing on the growth of the cyst, probably (Neelsen) because it is here as in hydronephrosis with intermittent obstruction of the ureter, where Cohnheim[33] says that constant intracystic pressure or tension soon causes atrophy of the secreting structures and only smaller tumors are formed; that the larger cysts occur there, in cases of stricture of the ureter and the like, that do not block its lumen constantly; that by the intermission in the tension the secreting structures are given a new impetus. And the cases in my collection, with a history of profluent discharges, have all had sacs of more than medium size.

Clinically, as a rule, these cases (if not virgins, like case of v. Ott) have either always been sterile or they have been so for a number of years. At the beginning of or during this time a carefully taken history will usually find subjective evidence of one or

more attacks of pelvic inflammation of variable intensity, which effected the necessary changes in tube or ovary, or both, and then caused them to unite. The functions of the pelvic organs during these years have never been normal, but rather regularly or constantly painful. Some of them (five clear cases in this collection of forty-one cases) have profluent discharges through the uterus that afford them temporary relief, but never bring spontaneous recovery.

Objectively we find nearly the same conditions as in hydrosalpinx or saetosalpinx serosa of August Martin,[34] from which, most authors say, it cannot be distinguished positively. But they are more difficult to extirpate. Hildebrandt in 1876 tied off one-sixth of the lower wall of the sac and left it. Schramm says the difficulty is not merely from their deep location, but that they have no pedicle. Sometimes they are intraligamentous, and otherwise they are so broadly and intimately united to the broad ligament that a part of this must be tied off and taken along, as in my first case.

Etiology. Here the case of Runge and Thoma and that of v. Ott are very instructive. In the former a hydrosalpinx was united by an adventitious side opening—not an accessory ostium—with an ovarian follicle cyst. The course of the muscular fibres in the adjacent tube-wall proved this, and the distant location of the closed abdominal ostium. In the latter case the saetosalpinx serosa formed a common sac with a parovarian cyst, the ovary being completely free. Such cases, among other evidences of inflammation, show the potency of this process in causing these formations (Veit), and they serve to render obsolete the ovulation theory of Richard, to make the assumption of a Fallopian tube congenitally united with an ovary (Beaucamp) less necessary, and they serve to deprive the ingenious theory of Burnier (Schroeder) of its unnecessary and doubtful complexness.

The classification of tubo-ovarian cysts is properly a subdivision of saetosalpinx serosa. The processes that pave the way for one of these may also do so for the other. It is germane, then, to consider how does a serous saetosalpinx come to exist. There are few reasons for, and many important reasons against, the view of Pozzi, L. Landau, Bland Sutton, and others that it is the final outcome of a pyosalpinx. On the other hand, a number of series

of experiments made by Kehrer,[35] Josephsen,[36] L. Landau,[37] Ratschinsky and Domaschewitsch,[38] Waskressensky,[39] and v. Rosthorn,[40] respectively, prove collectively that it is closure of the abdominal end of the tube that is followed by a serous distention of it, even without closure of the uterine end. A hydrosalpinx must be formed first, in the opinion of some authors (Neelsen, Burnier, and others).

From a study of specimens, from the result of experiments, and from the arguments of the best authors we may deduce the following conclusions:

1. Tubo-ovarian cysts come to pass in consequence of a plastic inflammatory union between a Fallopian tube and the adjacent ovary, after either or both of these organs and the intervening peritoneum have experienced a non-purulent pathological change of a cystic character; the septum intervening between the two lumina disappearing in consequence of pressure-atrophy from the tension of liquid confined on one or both sides of it.

2. This union of a distended tube-cavity (v. Ott) or with that of a peritoneal pseudocyst (Zedel).

3. In those rarer cases in which the fimbriæ are really found floating in the interior of the main cyst-cavity, we must assume either the congenital anomaly of an "ovarian tube," as was seen by Schneidemühl in a mare—as a *vitium primæ formationis*—or that an ovarian cyst or follicle cyst ruptured and the abdominal end of the tube dropped into the rent and was united to its edges by inflammatory action, thus making a joint cyst and tubal cavity.

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DISCUSSION ON THE PAPERS OF DRS. CHASE AND GOLDSPOHN.

Dr. I. S. Stone, of Washington, D. C.—Mr. President: Personally, I feel very greatly obliged to the gentlemen for these papers. Americans are apt to turn attention to the practical side and pay very little attention to questions of pathology. I was glad to hear Dr. Chase allude to the difference between the formation of a multilocular cyst and the ordinary cystic ovary. It is very generally believedby the profession, if my impressions are correct, that an ordinary cystic ovary may take on quite a large accumulation of fluid. I have heard this point discussed in medical societies. While I do not differ materially from Dr. Chase as to the amount of fluid contained in these cysts, I think sometimes we do see cystic ovaries, and while they may not become true ovarian cysts, still they constitute characteristic growths, and when examined thoroughly by the microscope are found ultimately to eventuate in a tumor. I would emphasize the point made by Dr. Chase with reference to the contents of such cysts being sometimes merely dropsical. They are practically retention-cysts.

Another point I would call attention to is the fact that he said in these cysts there was no corpus luteum. They are generally not very large, and it occurred to me that he did not draw quite as fine a distinction between these cysts and what are known as blood-cysts as he might have done. I would like to ask him to tell us, in his closing remarks, the difference between an ordinary blood-cyst in which the ovary has been removed and one in which there are no evidences of any corpus luteum. We probably may have a cyst in which there are no evidences of a corpus luteum. We may have, too, a blood-cyst of the ovary, and in some of these cysts there is quite a collection of blood, much more than I understood Dr. Chase to say was the rule.

There are some few points that occurred to me as Dr. Goldspohn read his paper, which I think he cleared up toward the latter part of it. I was going to ask him about the formation of these cysts. Dr. Bovee and myself have seen a larger number of cases than we were led to believe had been collected by the author of the paper. I do not recall how many we have seen in our work, but I think we have met with at least seven tubo-ovarian cysts. In regard to the formation, if there is an adhesion of the fibroma to the ovary or cyst, it is probably inflammatory, and in the vast majority of instances, I think the author said, such adhesions were of inflammatory origin.

Without attempting to consume any more time, it seems to me that if the members generally would speak upon these questions more and cultivate this branch of pathology rather than pay so much attention to the practical part, it would give our reports greater value, showing that we attempt to cover the field of pathology as well as that of practical surgery.

Dr. James McFadden Gaston, of Atlanta.—The papers that have been read have dealt with deviations from the ordinary cystic tumor. I wish to relate to the Association a somewhat unique case which occurred in my practice within the last twelve months. In the first place, there was a history of the early development of a large amount of fluid in the abdomen, my attention first being called to it after the abdominal cavity was so completely occupied that it was utterly impracticable to determine whether I had an ascitic accumulation or a cystic tumor to deal with. The distinction was such that, under the ordinary rules laid down for making such a diagnosis, it could not be readily done. I punctured it and found eventually that it was a cystic tumor. I observed, before the fluid had been drained to a very considerable extent, that the point of my trocar deviated from the median line. I punctured between the pubes and umbilicus. I eventually found a well-defined abdominal tumor. The woman became preg-

nant after the fluid was evacuated, and bore a child. I was called to see her subsequently; she awaited further developments, and expected an operation would be indicated. I saw nothing more of her. The physician who waited on her in confinement found that the tumor was very distinct and had increased in size, and when it had nearly filled the abdomen again I was called upon to operate. A singular experience occurred in connection with the preliminary steps of the operation which may prove of interest to the gentlemen here, since we are all confessing our shortcomings.

Among other things I ordered for the operation, which was to be performed in the country, was a 25 per cent. solution of carbolic acid in alcohol, and also a vial of the A. C. E. mixture. After cleansing the abdomen and our hands to proceed with the operation, the carbolic acid did not appear among the paraphernalia, so that the operation was undertaken without it. The parts were thoroughly scrubbed with soap and water and everything rendered as aseptic as possible. After commencing what we supposed was the use of our anesthetic and keeping it up for some time until about two ounces of the mixture was given, it was found that the patient had been inhaling the 25 per cent. solution of carbolic acid in alcohol. She had taken at least two ounces of this mixture before the mistake was discovered. The small amount of carbolic acid did not seem perceptible to the administrator of the anesthetic. We used the ordinary cone, but the carbolic acid leaked out around the edges, got on the face and caused excoriation in some places. We found that our hands were getting numb by coming in contact with the carbolic acid. I ordered a two-ounce vial of chloroform, and the operation was continued under this anesthetic. Instead of there being an ascitic accumulation of fluid, we had to deal with a myxoma, a kind of tumor which Senn describes, but one which is very rarely found in connection with the ovary. We found a gelatinous mass separating the walls between the different layers, and when the trocar was thrust into it only a small portion of fluid found its way out. The general outline of the cyst was not so persistent as is the ordinary cystic tumor, and I had eventually to scoop out the mass of gelatinous matter with the sac, and, lest some had escaped into the abdominal cavity, it was thoroughly washed out afterward. The pedicle was well defined, and I had no difficulty in ligating it. The woman progressed toward a satisfactory recovery. No harm whatever came from the inhalation of the carbolic acid.

The President.—I so often recognize the conditions referred to in the last paper that I feel I should like to say something with reference to the subject. Both papers are valuable. As Dr. Stone has said,

our meetings are usually devoted purely to the surgical side of these questions, and I am satisfied that the reading public wonder why satisfactory solutions are not given as to the origin and natural history of these growths.

Dr. Chase's paper is of great value in our study of the natural history of the growth of ovarian cystoma. But the second paper is of interest to me from a clinical standpoint, because I have seen so many tubo-ovarian cysts. Allusion has been made to blood-cysts, and the question asked is a very important one. I have always looked upon some varieties of blood-cyst as being quite virulent. A woman died in Brooklyn while under the care of Dr. Jones; a trial took place, and the case turned out to be one of blood-cyst. In my early experience I remember seeing sections done for the removal of blood-cysts, in which rupture of some of them occurred during their removal, the wound being subsequently closed without irrigation or drainage. These cases all died either of virulent sepsis or peritonitis. I recognize the virulent nature of these blood-cysts. In my own work, after witnessing the bad results of others, I have been more careful in dealing with that class of cases than with others as to the toilet and drainage. I do not know what they are pathologically, as I have not given them anything more than surgical study.

With reference to tubo-ovarian cysts I understood the author to say they were always of a dropsical nature. You doubtless remember the drawing in Schroeder's work of tubal fixation—a sacculated condition. I have myself recently seen a case of tubal fixation of an inflammatory nature in which there was a pus-sac. There was fixation of the bowel, with a cheesy disorganized ileum that required repair and which held a pus-accumulation. I have a specimen of tubo-ovarian cyst with twisted pedicle as large as a small bag-pipe. I allude to it to emphasize the fact that these conditions are much more frequent than is generally supposed. I should say from my own experience that I have met with tubo-ovarian cysts in more than 10 per cent. of my operative cases. Tubal abortions sometimes give symptoms of a tubo-ovarian or a tubo-sigmoid nature when the pavilion attachment of the tube to the bowel is small or large. Some cases if studied carefully would scarcely be recorded as tubal abortions. They are just as much cases of sigmoid pregnancy as of tubal pregnancy. The fixation to the bowel or ovary is friable and of an inflammatory nature. I have not been willing to speak of these cases as tubal abortions. They have nothing in their pathological or natural history that gives us a right to adopt such a nomenclature.

Finally, I would say that Dr. Goldspohn's interesting paper will be

of great value in that it will open the eyes of surgeons to the importance of post-operative study of specimens. Many of them are friable; the enucleations are difficult and many are ruptured in their removal. You can recognize them as early unruptured as ruptured, if you make it a point to study your specimens.

Dr. Chase (closing the discussion on his part).—The time for adjournment has nearly arrived, consequently I shall be very brief. I desire to make an inquiry in regard to the question which is somewhat closely allied to the subject so ably discussed by Dr. Goldspohn, although it may not seem exactly pertinent. There seems to be almost a universal desire to bring this up at this time. I refer to the question of the possibility of discharge of pus-tubes into the uterus. I wish to know whether the ostium is so completely occluded that these tubes cannot discharge themselves? When we get a well-developed pus-tube, does it ever discharge pus through the uterus? I would like to ask Dr. Goldspohn if he has had any experience along that line, and, if so, to give us the benefit of his careful clinical and pathological studies. I trust he may be able to throw some light on the subject.

Dr. Goldspohn (closing the discussion).—I would answer the question of the gentleman who spoke in regard to the greater frequency of tubo-ovarian cysts than I admitted, by saying that these cases occur very much more frequently than the literature shows, but it is simply because Dr. Stone and Dr. Bovee have failed to describe their cases and make them authoritative by distinctly answering the three conditions which I laid down in my paper as very essential to the recognition of tubo-ovarian cysts: *First*, to recognize the participation of the tube; *second*, the participation of the ovary by demonstrating some ovarian tissue in the wall of the sac; and, *third*, that their cavities are united by some opening through which the mucous membrane of the tube is continuous with the lining of the ovarian cyst or follicle. These are the three points that are wanting in the descriptions of a number of cases. For instance, the name given these formations by Richard, in 1853, was *kysts, tubo-ovarien*. Out of eleven cases he had seen he adequately describes only four. In addition to them, he speaks of a number of clinical cases with profluent discharges. That is not sufficient evidence for a pathological anatomist. In another instance, a man fails to prove in his description of his specimen the existence of ovarian tissue in the sac of the right side, a little oversight. The probability is it was there, but he did not say so in his description. We must adopt a system in order to make it of any value in this work. Every case must be carefully scrutinized in order to shut out ordinary conglomerates that are less purulent. I have used

the word non-purulent. The moment it is purulent, then the tubo-ovarian cyst is a different thing. It is not a cyst, but an abscess.

In regard to Schrœder's theory, I could demonstrate it in a minute on the blackboard, as announced by Burnier. I cover that point in my definition of tubo-ovarian cysts by saying that a cystic development is necessary only in one of the two organs, not in both. The tube may be normal and agglutinated on an ovary or on a cyst. It may have been an ovary that is not badly cystic. Schrœder's theory, in short, is this: the ampulla of the ovary or infundibulum is simply plastered on the ovary; there is a Graafian follicle within the ovary that is making its way out. It is not on the surface, but near the surface. The fact of the tube being implanted upon that particular segment makes it impossible for the ovary to rupture and get out. It is therefore confined and expands; it converts the ovary into a cystic body. As the cyst enlarges the distance between the part of the cyst which is approximate to the agglutinated tube, the wall becomes thin until it finally ruptures. When rupture takes place the ends of the fimbriæ are pulled apart by the expansion of the cyst and finally fluid empties into the open cyst-cavity. This is Schrœder's theory, or that of Burnier. This whole matter is made altogether impossible by the observations and experiments of others since that time, so I did not touch on it as one of the well-substantiated theories, such, for instance, as the ovulation theory of Richard.

In regard to the profluent tube, when the contents of the tube have become purulent, the emptying out through the uterus is a very rare affair, if it ever occurs. A true pyosalpinx will not frequently empty itself. But in hydrosalpinx emptying of the tube into the uterus does occur relatively frequently. I can say from my own experience that I am thoroughly convinced of having had at least a dozen cases of intermittent profluent emptyings of tubal cysts out through the uterus.

As far as the clinical bearing of these profluent discharges is concerned, I would not open the abdomen to extirpate a hydrosalpinx that I felt confident would empty itself or showed a disposition to do so. If I am permitted to digress a little here, I will briefly say what I have done. I have condemned abdominal section in some of these cases, simply confirming the opinion of two or three other professional men before me. In one case the patient refused to have the abdomen opened, but she was willing to have the cyst manipulated through the vagina. She was sent to the hospital to be anesthetized, so that I could carefully examine her. In her case there was a cyst the size of the crown of an ordinary man's hat. It bulged to such an extent that the vaginal vault was pushed down very markedly and the cyst was

felt above. The patient was told by a gynecologist that she ought to have a laparatomy performed, but she declined to have this done, and sent for me. I confirmed the opinion of the other gynecologist, but she could not be persuaded to have an operation done. I gratified her wish by simply draining the cyst through the vagina. I found the vaginal wall pulled a considerable distance away from the cyst-wall. When the retractors were placed in the vagina adhesions were found to the cellular tissue between the vaginal wall and cyst-wall, and while studying to determine the best course to pnrsue there was so much compression of the sac that down came the liquid through the uterus. The cyst was the size of a man's hat. I then said to myself, "Hands off!" I told her to go to bed, to remain at home a couple of weeks, and then come back again. I let nature take its own course in emptying the sac. She returned, I curetted the uterus, canterized and packed solidly the entire endometrinm, the idea being to place a foreign body in the uterus npon which it could contract. Part of the tube which passes throngh the uterine wall was constricted. I reasoned on this basis, that if we could make the uterus contract upon this foreign body, whatever was left in the cavity would facilitate the emptying out, which turned ont so in that case. Then, after simply passing a current in the uterus and irrigating the cavity once a week for six weeks, the entire tubal sac disappeared, the woman recovered, and has remained well for two years. I would not do this, however, unless I was certain the sac had emptied itself. Certainly, any snch treatment of a sac that is closed would be disastrous.

Dr. H. W. Longyear, of Detroit.—I would like to hear Dr. Price express himself with reference to the necessity of operating on cases which discharge themselves throngh the uterns.

Dr. Price.—I am satisfied Dr. Goldspohn has put the matter to us fully, clearly, and scientifically, and I agree with him that it is the only gronp of cases which discharge their contents throngh the uterus. Perhaps a case of acute virulent pyosalpinx might discharge a small plng of pns, but the discharge, it must be remembered, lasts only a limited time. It is my experience in ordinary cases that pus never really discharges itself through the uterns, and when practitioners speak of cases of pns emptying through the uterus and getting well, it is a mistake.

In regard to the management of these obstinate pus-tubes, I have some doubts in regard to the propriety of the procedure carried out by the Doctor. He will never probably meet with another such case.

Dr. Longyear.—I have seen one case of pus-tube that, I believe,

discharged its contents through the uterus; but usually these cases have to be dealt with by abdominal section.

Dr. Price.—I think all of us are agreed that there is but one treatment for occluded tubes, and that is to remove them, whether there be blood, pus, or water in them.

Dr. J. Wesley Bovee, of Washington, D. C.—The reader of the paper has described to us quite distinctly the difference between a tubo-ovarian cyst and a tubo-ovarian accumulation of purulent material. He has not demonstrated whether the fluid is non-purulent or purulent.

Dr. Goldspohn.—If there had been time to have read my paper *verbatim*, a great many of the questions asked would be answered. I supposed it to be clearly understood that the cases I dealt with were not purulent. It need not be clear water. It may be the contents of ordinary ovarian or glandular cystomas are not purulent, and the little discharge coming from them and getting into the abdomen is not a serious matter. Nobody is afraid of it. When they are purulent they become abscesses, and we have a different class of cases to deal with. We are talking about cysts and not abscesses. A microscopical examination was made of two cases in which the fluid was simply water.

MOVABLE KIDNEY.

Local and Remote Results.

By A. H. CORDIER, M.D.,
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Any tumor or organ in the abdominal cavity capable of being moved over a large and unnatural area is designated as a floating or movable tumor or organ, according to its range of mobility and relation to the peritoneum. The organ most frequently found so displaced is the kidney. Those engaged in abdominal work are frequently asked why there are so many cases of movable kidney today, when a few years ago it was rarely heard of. The modern diagnostic technique and late and correct interpretation of manifested symptoms have led to the correct location of the cause, hence the seemingly greater prevalence of this condition. It is an extremely common one.

Many women, no doubt, are about our streets with kidneys on the brink of the true pelvis, and that, too, without a single disturbance, yet the greater majority sooner or later present the "movable kidney syndroma" in a more or less pronounced degree.

It is stated that one out of every five patients examined has a movable kidney. I believe this rate too large, especially if that implies a displacement of pathological significance. Undoubtedly it occurs with greater frequency in women, but not with the relative frequency of twenty to one, as some writers would have us believe. While the rapid absorption of fat and laxity of the abdominal muscles from or following pregnancy are fruitful sources of a displaced kidney, added to which is the pressure of the corset against the liver, and that in turn against the kidney, all aids in displacing a woman's kidney, not occurring in man, it must be remembered that the abdomens of fifty women are examined for

every one of men, and that many a movable kidney is discovered by accident and not because the individual presented symptoms directed to the kidney as their source. It remains a fact, however, that the condition is more frequent in women than in men.

While the floating kidney is freely movable, all movable kidneys are not floating. The former is congenital and is extremely rare. With all its mobility it does not, as a rule, give rise to the usual distressing symptoms of the acquired mobility. The congenital form of movable kidney moves freely about in the abdomen, its long pedicle, as well as the kidney covered by peritoneum, permitting it to glide about among the intestinal coils with little or no resistance, its pedicle adjusting itself to the surrounding ducts, vessels, etc., etc.; thus it is not so likely to become obstructed as if the mobility was of recent origin. In the great majority of cases the movable kidney is healthy.

The right kidney is most frequently displaced. This, also, is a condition found oftener in women than in men. Gall-stones and distended gall-bladders are found in women six times as often as in men. Recognizing this fact, it is reasonable to presume (and it is a fact) that there exists a causative relation between these conditions. Any mechanical obstruction to the free outflow of the bile must of necessity induce changes in this fluid, retained in the gall-bladder, favorable to the deposit of its salts and the production of stones. Tight lacing and movable kidney are the factors most frequently found in the production of this defective bile interchange in the gall-bladder. In a number of my cases it has been a hard question to determine whether the distended gall-bladder or the movable kidney was producing the most distress or demanded the earliest surgical interference.

Mrs. J. C. J., aged forty-two years, nullipara. Three years ago had both uterine appendages removed. Later was operated on for a post-operative hernia. At the time I first saw the case she presented the usual train of symptoms of a movable kidney. (By the way, these were the symptoms she most complained of before her first operation.) She was greatly emaciated and had well-marked Dietel's crises, and accompanying these attacks she usually became slightly jaundiced in addition to presenting uremic symptoms, as headache, nausea, pains in limbs, and the like. On examination I could make out the outlines of the kidney, freely

movable, and in addition the gall-bladder could be felt enlarged and slightly painful on firm pressure. The enlargement of the gall-bladder could be made to disappear in a measure, showing that there was not a permanent or complete obstruction of its duct. That no further mistakes be made in her case, I made a small anterior opening over the gall-bladder and explored it and its duct for stones, but none were found. This incision was closed and the usual lumbar incision made, and the movable kidney anchored with three silk sutures to the fascia and muscles. Since the operation all her gall-bladder symptoms have disappeared, her appetite, digestion, and assimilation have greatly improved, and she writes me that she feels better than she has for years.

In her case the pedicle of the movable kidney produced a partial obstruction of the common and cystic ducts, hence the gall-bladder symptoms.

Fenger, in a recent article, recalls the statement made by Landau and Ferrier that "the descent of a movable kidney is the cause of that form of hydronephrosis having its origin in a bending of the ureter, the bending of the ureter taking place at its junction with the pelvis, as at this point the ureter is held against the posterior abdominal wall by strong connective tissue, and does not follow the kidney." The hydronephrosis is first temporary, then permanent, according to the obstinacy of the bend in the ureter to the intra-kidney pelvic pressure. The fluid is usually aseptic, but often in the progress of the case it becomes septic (pyonephrosis).

Dietel's crises in movable kidney are due to a twist in the pedicle. The seizures are characterized by attacks of nausea, severe pain, diminution of urine temporarily, followed by polyuria. These occur at irregular intervals for an indefinite period. The attacks simulate renal colic, but can usually be diagnosticated from that condition by the absence of blood in the urine, and pain passing down the ureter with the descent of the stone.

In or following these crises (Dietel's) the patient suffers from more or less headache, foul tongue, vomiting, and other symptoms of uremia.

In any disease of the kidney that leads to a retardation of the elimination of the products of metabolism, the stomach, in its endeavor to perform this function, excretes this product and acts as a self-poison to its normal function, as manifested by nausea,

vomiting, pain, and other dyspeptic symptoms. These symptoms are often mistaken for those accompanying primary disease of the stomach. They may be present without the kidney being involved by any pathological changes, as from movable or floating kidney. Dilatation of the stomach and movable right kidney are associated in 55 per cent. of the cases of gastrectasis. Osler seems to think this a mere coincidence, but I believe that any condition associated with another in so large a percentage of cases must have some causal relationship with the other.

During the attack in which the pedicle is constricted or twisted a rapid increase in the size of the mass is noticed, this enlargement being due to a hydronephrosis and increased vascular engorgement. Much the same phenomenon in this respect is noticed in a twisted ovarian cystoma pedicle, except that in the former there is a physiological fluid being poured into the enlargement. A diagnostic point as to whether the symptoms are due to stone or a twisted pedicle is that, as a rule, the pain is not relieved in the latter by assuming the recumbent posture or by replacing the misplaced organ if detected in an abnormal position. In movable kidney, with the subsidence of Dietel's crises the urine is not bloody, as a rule; it may even be limpid and of a low specific gravity. These symptoms of torsion may, if the bending or twisting of the pedicle be firm enough, assume a most alarming character. A patient with strangled ureter and renal vessels will present symptoms of shock or collapse in proportion, as a rule, to the completeness and duration of the strangulation. The alarming symptoms disappear quickly if the kidney is replaced, differing in this respect from all other suspected conditions that may produce very similar symptoms pointing to that locality as their source. A movable kidney is often detected by the careful diagnostician when it would escape the notice of one not systematic in his work, and it is from this reason that I think this condition is discovered so frequently by those devoting special attention to abdominal and gynecic surgery. We should be cautious in making a diagnosis of movable kidney in a patient slightly advanced in years who presents symptoms of gastric disturbance, as these symptoms are diagnostic of a pyloric cancer as well as movable kidney. Especially should extreme caution be used in the physical examination, as an early malignant pyloric growth may be found freely movable

at or below the umbilical region. The usual history of changed gastric secretions, especially those vomited, age of patient, pain on taking food, and character and persistence of pain are sufficiently diagnostic to point to the stomach as their true source. Gall-bladder enlargement must be eliminated. This is best done by noticing that the enlargement cannot be made to disappear under pressure and that it is at the gall-bladder site at the edge of the liver. Absence of tympanitic resonance in front of the bladder is usual with the movable kidney. If the gall-bladder is freely movable its pedicle will be found attached at the diagnostic point. Its movement with the breathing will be synchronous with that of the liver and diaphragm. Symptoms of gall-bladder pathology will be found in the case, such as biliary colic, differing very much in severity from the pain of a movable kidney, even where the gall-duct is compressed enough to produce jaundice. A marked feature of the jaundice, when present and due to a movable kidney, is that it is not intense and is of a transient and recurring character with an absence of the usual symptoms of a gastro-duodenitis. In many of these cases in thin subjects (and they are usually emaciated) the kidney shape of the suspect is easily made out, and occasionally the renal artery can be felt pulsating at its entrance into the hilum of the organ.

If the displaced organ is anchored at the time of the examination, a history of inflammatory attacks in that locality can usually be elicited. The colon resonance is usually to the inner side or in front of the kidney. The corset lobe of the liver may be misleading, but its continuance from lower border of liver, both on palpation and percussion (dulness), and the thin, sharp edge are characteristics belonging to this rare condition that are sufficiently diagnostic.

Cancer of the head of the colon in its early history, or before its extension to surrounding organs anchors the cecum, may easily be mistaken for a movable kidney if the examiner is not thorough in his diagnosis. A cancer in this locality is usually accompanied by pain of a different character from that of movable kidney, being more continuous. Gaseous and fecal obstructive symptoms are usually present. One symptom alone, when present, is almost diagnostic in its importance. I refer to the alternating increase and diminution of the size of the growth and the slight

changing of its location during the examination of the mass, this being brought about by the vermicular intestinal movements and relative quantity of gas present in the cecum.

The long axis of the kidney is generally vertical, and the kidney shape can usually be made out. Kidney resistance is greater than that of gall-bladder or other fluid enlargements.

An elongated fluid tumor in line of the ureter, that comes and goes, is always a hydro- or pyonephrosis. The urinary analysis and ureteral catheterization will assist in making a correct diagnosis.

Fecal impaction or foreign bodies in colon may be misleading in their appearance, shape, mobility, consistence, and history, but a close inquiry into the history will usually reveal an absence of many of the diagnostic symptoms of movable kidney, and the presence of indications pointing to the colon as their source. On physical examination foreign bodies in the colon will not cause symptoms to disappear by pushing the mass up under the liver, and if the body can be moved in the gut it does not return to its original site on assuming the erect or other posture. The sensations of faintness and pain are not produced by handling an intestinal mass. There will be no history of transient enlargement in the mass during the menstrual period, as is often the case in movable kidney.

A movable kidney may be mistaken for an appendicular abscess or inflammation of the appendix. Fenger reports such a case as occurring in his practice years ago, before the pathology of appendiceal disease was understood. Appendicular disease occasionally runs a mild course without any elevation of pulse or temperature. This and the location of the pain, especially if the appendix is post-cecal, may be very misleading; but here, as in all abdominal diagnoses, the history must give way to the physical examination, and the deductions as to the location and character of the pathology principally be made from the latter. If all abdominal diagnoses were governed by this rule, fewer mistakes would be made, and the necessity for exploratory openings would be less frequent in the hands of men who should be diagnosticians as well as mechanics. A careful diagnostician and good pathologist will not, as a rule, have any difficulty in differentiating a movable kidney from appendicular disease.

In two of my cases a cramping of the muscles on the plantar surface of the foot was a marked symptom, and cannot be explained on the theory that systemic uremic poisoning produced the spasms, as in both cases the kidney function was not perceptibly impeded in the least. The spinal and sympathetic anastomosis is the most acceptable. In both cases these symptoms disappeared after nephrorrhaphy.

On pressure a sickening pain is produced, very similar to that made by firm pressure of the ovary or testicle. A sensation similar to that produced by shooting a plum-seed from between the fingers may be elicited by the examiner by grasping the organ between the two hands and pressing them firmly together.

I have noticed in a number of instances that during the menstrual period the kidney enlarges slightly and becomes more painful, and the attacks of nausea and general nervousness are more pronounced. The pain is increased by exercise, and is felt in the side affected, often shooting down the inner side of the thigh. A loaded colon, or even a gaseous distention of the bowel, increases the pain. The pain is often referred to the bladder, urethra, labia majora, thighs, and to the inner side of the knee.

In one case the mobility was accompanied by a throbbing in the region of the abdominal aorta, and this vessel's impulse was so plainly felt that an aneurism was suspected and added to the throbbing an indistinct bruit. The resemblance to an aneurism was indeed very striking. While examining this case, having felt the pulsating of the aorta and the seeming enlargement of the vessel at that location, on pressing the kidney into its normal position it was noticed that the pulsation diminished very much and the decrease in the size of the pulsative enlargement was very perceptible. I cannot offer any other explanation of this phenomena than that the aorta with the vena cava was pulled out of its "bed," or that a slight kinking produced a partial constriction of the aorta (or more likely the vena cava) and a dilatation above or below the point obstructed.

The origin of the right renal vessel is in close contact with the right abdominal aorta above, and below the superior and inferior renal plexus are found. It is only necessary to recall the close and free union of the sympathetic branches with the spinal (as the external cutaneous and genito-crural) to understand how and why

a kidney dragging on its pedicle may produce pain and uneasiness along the distribution of the filaments of these nerves. A pain referred to the region of distribution of the lower sacral and coccygeal nerves has been quite a frequent symptom in a number of my cases of movable kidney. While the symptoms of movable kidney may be of great assistance in diagnosticating these cases, they are not of sufficient significance to be designated pathognomonic. One symptom in particular is of diagnostic import. That is the usual relief of the pain, dragging, and uneasiness on assuming the recumbent posture. This is due to the assuming of its natural position by the displaced organ.

In cases in which transient and recurring jaundice is a marked feature, the question may arise as to whether or not the cholemia be due to a pressure on the duct from without by the taut vessels or to a gallstone in the common duct acting as a ball valve. In arriving at a conclusion the fact must be recalled that in gallstone jaundice due to ball-valve stone in the common duct there is almost invariably an elevation of temperature at the time, frequently preceded by a chill due to the absorption of septic material. The presence of a stone in the duct near its entrance into the duodenum usually results in the establishment of an avenue of absorption, and it is just at this locality that lymphatics abound most plentifully. A movable kidney may at the same time be a suppurating kidney, and in that event the elevation of temperature as a diagnostic helper would lose part or all of its value; but it must be remembered that in a suppurating kidney a history of pyuria can always be obtained where the ureter is patent. If the ureter is occluded, then the kidney tenderness, enlargement, and persistence of temperature are diagnostic of kidney as compared with gall-bladder absorption.

Many cases do not demand any interference, as all cases of movable kidney are not accompanied by symptoms of any significance. I have very little faith in the promise of any mechanical support or device for holding the organ in its normal position.

The operation (nephrorrhaphy) for the replacing and holding of the kidney in its natural position offers the greatest prospect of a permanent relief of the symptoms and a restoration of the patient's former good health. Where this fails with repeated

efforts, or where the organ is diseased, the question of removal (nephrectomy) is to be considered.

I believe that all are agreed that the extraperitoneal operation is the proper one to perform, unless there exist other complications, intraperitoneal, demanding an investigation or operation, or where the diagnosis as to the exact or all of the pathology is in doubt. When the peritoneum has been opened in front and the true state determined in the doubtful cases, it is best even here to close the anterior incision and anchor the organ through a lumbar opening.

Deductions. 1. A movable kidney often produces a dilated stomach, with all the accompanying symptoms of a disease of the latter.

2. It is a fruitful source of gallstones by the pedicle producing a partial obstruction of the common duct.

3. The bending of the ureter often gives rise to a hydronephrosis. This, in turn, is sometimes converted into a pyonephrosis.

4. It may produce death by a complete strangulation by a torsion of the vessels and ureter.

5. By dragging on the abdominal aorta and kinking of the vena cava, a condition simulating an aneurism of these vessels may be produced.

6. Pain referred to the region of distribution of the spinal nerves is often produced by a movable kidney's disturbance of the abdominal brain.

7. A general nerve-exhaustion (neurasthenia) is frequently induced by this condition, interfering with digestion, assimilation, and elimination.

8. Nephrorrhaphy is a safe and effective surgical procedure.

9. All cases of movable kidney, if accompanied by symptoms pointing to the kidney as their source, should be operated upon.

10. In summing up the local and remote results of this now often recognized condition, I think the correctness of the deductions has been often demonstrated by the disappearance of each and every symptom after a restoration and retention of the kidney to its normal position.

11. Symptoms are not to be relied upon in making a diagnosis of movable kidney; the physical examination is the only trustworthy guide.

LIMITS OF NEPHRORRHAPHY.

By HUGH M. TAYLOR, M.D.,
RICHMOND.

An examination of the literature of this subject must convince us that the limits of nephrorrhaphy are not very clearly defined; also that there is by no means unanimity of opinion as to the frequency of nephroptosis, and certainly a wide diversity of opinion as to its power to induce discomfort, ill health, or death. Men whose opinions merit consideration question its frequency, its potency for evil, and consequently the need for operative interference for its relief. Many of these are not "doubting Thomases" by nature, but in other fields are markedly progressive, and in not a few instances are veritable pathfinders.

Not looking for displaced kidneys, they do not find them; not finding them, they fail to associate neurasthenia, gastro-enteric disorders, and the condition of Dietel's or renal crisis with such an etiological factor. Moreover, we find in this class many who, while admitting the frequency of nephroptosis, agree with Legry and others in regarding it as more of an infirmity than a malady, and only exceptionally requiring surgical interference.

On the other hand, we meet with a second class of clinicians who are able to associate with every case of nephroptosis some sufficiently serious morbid condition to warrant in every instance nephrorrhaphy, a radicalism as equally irrational as that advocated by Keppler, who saw in every case such a menace to life as to call for nephrectomy.

A third class of observers endeavor to differentiate between the case of nephroptosis giving trouble and one that does not; in other words, between the operable and the non-operable cases. This class has, I think, taken conservative and tenable ground, and is becoming larger, and must continue to increase as the study of this subject becomes more general.

With diversity of opinion among men, many of whom are regarded as pioneers, it is but natural that the rank and file of the profession should look upon the limitations of nephrorrhaphy as an unsettled surgical problem.

This Association composed as it is to a large extent of specialists, wields a wide influence in shaping thought and practice, and its responsibility is correspondingly great.

It goes without saying, that it is not logical to consider the treatment of nephroptosis as we would that of nephrolithiasis, and it is just as irrational to class all cases as operable or inoperable as to so regard all cases of enteroptosis or tubo-ovarian ptosis. This fact is duly appreciated by many special students of this subject, but not to the same extent by a large class of general practitioners, by whom a majority of such cases are first seen and advised.

I wish to emphasize in the beginning that it is not my purpose to enter a protest against nephrorrhaphy, but I do wish *to protest against its abuse.* More latitude than the title of this paper indicates is essential to a clear understanding of the needs for nephrorrhaphy. We must notice the frequency of nephroptosis, its potency to induce suffering, poor health, or death, and the manner in which it brings about such states.

Is nephroptosis a common condition? Yes, in the experience of those who look for it; and it seems that an increasing number of investigators are finding cases.

As an evidence of its frequency, Glenard reports having personally seen 537 cases in eight years. Lindner expresses the opinion that one woman in every five is the subject of movable kidney. Edebohls found 90 cases in a series of 500 women examined. Noble found it in one-fourth of his patients.

Osler, in his *Lectures on Diagnosis of Abdominal Tumors,* says: "I have no statistics to offer with reference to the frequency of movable kidney; but, throughout the session, you have had many opportunities of noting its commonness—so common that we are never without examples in the ward."

In a recent paper read before the American Association of Genito-urinary Surgeons, Dr. Francis Watson expressed the conviction that the importance of this subject was not sufficiently recognized in this country.

In discussing this paper, Dr. J. William White said he was

quite well satisfied that movable kidney existed far more frequently than many supposed.

Dr. Francis Minot asserts "that it is now recognized by most clinicians as by no means rare."

We have been surprised to note how little our standard text-books have to say as to the frequency of nephroptosis. The *American Text-Book of Surgery*, Moullin's *Surgery*, Treves's *System, A System of Surgery* (by Dennis), *System of Genito-urinary Diseases* (Morrow), Osler's new edition of *Practice of Medicine*, Hare's *System of Practical Therapeutics*, are all silent as to the frequency of this trouble.

It cannot be, however, that the observers that we have quoted, who attest its observed frequency, can be so radically wrong. This conclusion is borne out by my own limited experience; for since I have been systematically looking for nephroptosis I am surprised at the number of cases I have been able to diagnosticate, and I find myself a full convert to the belief that it is very common in its occurrence.

Does the movable kidney always produce suffering or ill health? Not always. There seems to be unity of opinion that many if not a majority of cases do not induce either discomfort or disease.

Osler writes: "In a large majority of cases the condition gives no trouble, and it is well, if detected accidentally, not to let the patient know of its presence."

According to Noble: "In many cases, movable kidney gives rise to no symptoms; therefore, does not require treatment. In a large percentage of the cases passing through my hands, I believe in nearly half of them, the symptoms complained of have been comparatively trifling, and symptomatic treatment has been sufficient to make the patients comparatively comfortable."

The American Text-Book of Surgery reminds us "that the symptoms may vary from a slight uneasiness to agonizing pains."

Moullin says "that sometimes floating kidney merely causes inconvenience; at other times intense suffering."

Mr. Treves says: "In many cases the symptoms are so trivial as to require no treatment."

Minot asserts: "It frequently happens that movable kidney exists without being accompanied by any symptoms. It may be discovered accidentally sometimes by the patient."

J. William White and Furness, in Dennis's *System*, speak of "the symptoms of movable kidney sometimes amounting to only slight uneasiness, and at times to excruciating agony."

Homer Gage says: "It is only when, by its mobility, it occasions symptoms that interfere with one's ordinary occupation or habit of living that any operation is indicated."

He thinks most surgeons would go a step further than Mr. Thornton, and say that no operation should be undertaken on a healthy kidney simply because it floats or is movable.

Johnston, of Richmond, says: "Nephrorrhaphy is not indicated in every case of dislocated kidney."

In the *American Year-Book of Medicine and Surgery* (Gould), 1896, we find the comment: "There can be no doubt that too many operations are performed for supposable movable kidney; the procedure threatens to become the fashion."

Legry writes: "In a certain number of cases, movable kidney does not give rise to any functional trouble."

Many expressed opinions in accord with this could be cited. A striking illustration of the correctness of such views recently came under my notice. One of our graduated nurses was taken with fulminating appendicitis. Palpation revealed a very distinct tumor in the appendicular region, an unexpected occurrence early in a first attack of fulminating appendicitis. A section disclosed a necrotic appendix and a movable kidney—the latter was the supposed tumor felt in the appendicular region. The kidney was behind the peritoneum, had no mesonephron, but it had a range of movement from the iliac fossa to the diaphragm. I had known this woman for years. In doing private nursing, and while a pupil in a training school, she had shown herself exceptionally strong, and as far as was known, was without aches or pains. This was a striking example of wide range of movements and no symptoms.

I think it was Mr. Treves who *classified nephroptosis clinically under three heads:*

1. Patients who have displaced kidney and do not know it, and suffer no inconvenience whatever from it. This type, in my opinion, represents by far the largest class; a majority, according to Osler; one-half in the opinion of Noble.

2. Patients with misplaced kidney who may or may not know

it, who suffer from gastro-enteric discomfort and perhaps a long train of vague neurotic disturbances. In this type we find the largest class calling for operative interference.

3. Patients with movable kidney who are subjects of occasional or frequent mild or severe attacks of Dietel's or renal crises. This, in my opinion, is the least frequent type, but the urgency of the symptoms more frequently demand operative interference.

We have seen that while nephroptosis is frequent in its occurrence, *more than fifty per cent. of cases are attended by no symptoms and need no treatment.*

Is nephrorrhaphy indicated in all of the remaining less than fifty per cent.? Certainly, we think, not. We have no statistics to show the proportion of cases in which the effects of nephroptosis are focussed on the nervous system or the gastro-enteric function, nor in what proportion of cases we may expect Dietel's or renal crises. A pertinent question is, "Is the neurasthenia, gastro-enteric disorder, and renal crises invariably due to the displaced kidney? May not other morbid conditions produce the same effects, or those so closely simulating them, that it is difficult, if not impossible, to make a differential diagnosis?" To answer this question satisfactorily, it is necessary to consider in what way does the movable kidney induce neurasthenia, gastro-enteric disorder, and Dietel's or renal crises, and what are the other conditions that will produce like effects.

Among the many conservative expressions of the late Professor Goodell, not one appeals to my better judgment more forcibly than his remark, "Gentlemen, the crying medical error of the day is, in my opinion, the mistaking of nervous disease for womb disease.' Does not this caution apply to operative interference for movable kidney? Is it not true that a wide range of nephroptosis is consistent with good health in a majority of cases? Is it not true that a multitude of factors other than movable kidney induce the same neurasthenic manifestations? Are we not justified in claiming that one of the dangers of the hour is the mistaking of nervous diseases due to other causes, for those incident to nephroptosis? Many ovaries and tubes have been and are to a lessened extent still being removed for the cure of neurosis which has its origin in the brain and not the pelvis. Many kidneys, in my opinion, have been and will be anchored for the relief of neuras-

thenia due to some other morbid state. On the other hand, pelvic viscera are occasionally attacked when a movable kidney is the source of trouble. Not long since I assisted one of my colleagues in removing a prolapsed tube and ovary. Prolonged invalidism, we thought, warranted the operation. No benefit ensued. We now find she has a markedly movable kidney. Is it responsible for her discomfort? Or is the source of the neurasthenia, etc., in her brain? I know of no way of telling except by resorting to nephrorrhaphy. If she is cured, then the operation was justifiable; if she is not, then we were mistaken in our diagnosis of neurasthenia from nephroptosis.

A young girl, a victim of neurasthenia and dyspepsia, had been under my care for several years. The cause of her ill health was supposed to be in her pelvis, although no lesion could be discovered. Her tubes and ovaries were regarded with suspicion. Within the past year I discovered a very much displaced right kidney, and nephrorrhaphy within the past few months, as well as I can tell at such an early date, promises a cure.

Six or eight years ago I treated a young married woman for some supposed womb trouble. In the language of Dr. Joseph Price, probably I was guilty of "uterine tinkering." Conception fortunately stopped me before I infected her uterus and tubes. A year or so later I thought she had beginning lateral curvature. I had her back massaged and referred her to a gymnasium. Two weeks ago an examination revealed a movable right kidney, which I can wallop all around in the right side of her belly. I did not advise nephrorrhaphy. She is nervous, and at times has distressing headaches and pelvic and lumbar discomfort; but life is not rendered unenjoyable, nor is it endangered, and she suffers, in my opinion, not more from the discomfort mentioned than do a majority of society, shop, or factory women.

If we take as a standard of health a perfectly balanced nervous system, I am afraid we will find among our American women very few who will come up to such a standard. In many instances it is impossible to say what is inducing the neurasthenia. We mistake the neurasthenia due to displaced kidney for that due to pelvic disease; it is just as probable that we will attack the kidney when the cause of the neurosis is in the pelvis, the brain, or due to some such condition as lithemia or phosphaturia.

More than one possible source of neurasthenia may coexist. A case now under my observation illustrates this. A multipara has a torn vagina, backward displacement of the uterus, tubo-ovarian ptosis and nephroptosis. In spite of her many maladies she is on her feet most of the day, and does all the house-work for her family—namely, washing, ironing, cooking, and the like. She has back and pelvic aches, is nervous, and has dyspepsia. Which condition causes the trouble? She will not be operated upon—her suffering has not driven her to it.

Within the past two weeks the following cases have been met with, which illustrate the frequent coexistence of more than one possible source of neurasthenia and gastro-enteric disorder and the not infrequent errors in diagnosis:

A young married woman has a torn cervix. There is considerable erosion, and hard and painful cicatrix. She is neurotic, and has been so since her girlhood. For the past year she has entered the large class of neurasthenics, and seeks relief. I find that she has also a very freely movable right kidney. To what is the condition of neurasthenia due—to the torn cervix, the nephroptosis, or to the inherited or acquired neurosis?

A married woman, aged about forty years, has a movable hard tumor of the pelvis, seemingly a subperitoneal fibroid. It is as large as a fetal head, rises above the pelvis, and is very movable. She is neurotic, and has gastro-enteric disorder. She has also a freely movable right kidney. Is this last-mentioned condition at all a factor in inducing poor health?

A young governess applied for treatment for dyspepsia in June, 1896. Dietetic, hygienic, and therapeutic advice was given. Since that time she has had five or six violent attacks of colic, attended by nausea, vomiting, pain, and the like. On examination, I now find a very freely movable right kidney, and the conclusion is reasonable that the attacks are those of Dietel's crises from a flexed ureter; and the indigestion is presumably due to traction by the displaced kidney.

Nephrorrhaphy for the relief of neurasthenia must be limited by our ability to differentiate between neurasthenia incident to nephroptosis and that due to some one or more of the many sources of neurasthenia; and until this perfection in diagnosis is attained many kidneys will be anchored in vain.

I indorse emphatically the following views of Dr. I. S. Stone: "We do not wish the operation to become universal as trachelorrhaphy or even as oöphorectomy, which required a vast accumulated experience to stay the hands of men who did these operations upon the slightest pretext."

To what morbid or mechanical condition must we credit the gastro-enteric disorders such as eructations, pyrosis, nausea, vomiting, constipation, and the like? Many explanations have been offered, and in many instances it is difficult to tell the cause from effect. This is especially true of the coexistence of movable right kidney and dilatation of the stomach.

Bartel was the first to call attention to the frequent coexistence of these two conditions, and thought the dilated stomach was due to pressure upon the duodenum by the kidney. It is hard with our present knowledge to ascertain which is the primary trouble, the displaced kidney or the dilated stomach; and, consequently, which is giving rise to the effects for which we operate. If the dilatation of the stomach, retention of food and its consequences, are not due to traction or pressure by the displaced kidney, then nephrorrhaphy will not remove the cause and cure the disease.

Moreover, when dilatation of the stomach has from any cause persisted for a long time, fatty or other degeneration of the muscular fibres is likely to ensue with diminished chances for restored function.

Litten noted the frequent *coexistence of dilatation of the stomach and nephroptosis.* In forty cases of dilatation of the stomach, he found twenty-two cases of displaced kidney. He considers the dilatation of the stomach the primary trouble, and the displaced kidney a secondary result. If we concur in this view, nephrorrhaphy must be attended by many failures.

Ewald, Osler, Nothnagel, and others, while admitting the frequent coexistence of dilated stomach and movable kidney, think it merely a coincidence.

To me it seems there must be some relation of cause and effect. I can understand how a displaced kidney may, by traction or pressure, induce flexion or obstruction of the duodenum with food stasis, fermentation, and dilatation of the stomach. I can also see how a gastric dilatation from other causes may by pressure displace the right kidney. Competent observers question if the normally

slightly movable kidney is ever displaced by the distended stomach or descent of the liver in inspiration.

A theory advanced by Glenard is that the nephroptosis is merely a part of a general abdominal, entero- or visceral ptosis.

This condition begins with an elongation of the ligaments and a prolapse of the liver, pylorus, duodenum, and right colic flexure. Flexion, food stasis, fermentation, etc., are further results. Nephrorrhaphy will not restore the prolapsed right colic angle and relieve the flexed duodenum. In this instance it is hard to tell which condition is primary.

Mr. Treves has benefited enteroptosis by shortening with sutures the overstretched ligaments.

Still another explanation of the gastro-enteric symptoms in nephroptosis is that they are due to tension upon filaments of the great sympathetic centre (the solar plexus). This view is held by Edebohls and others, who deny that traction or pressure upon the duodenum causes the trouble, as shown by the fact that the same train of symptoms occurs when the left kidney alone is displaced.

There is one thing I cannot reconcile to this nerve-tension theory, or, in fact, to any of the several theories we have mentioned —namely, that the *severity of the symptoms* of nephroptosis, neurotic, gastro-enteric, or those of Dietel's or renal crises, *is not in proportion to the degree of displacement.* This is a matter of common observation. In more than one instance I have seen the maximum bad effects, while the kidney was hardly appreciably below the ribs—its motion seemingly not more than its limited normal movement—while with great displacement we may have a slight or no noticeable bad effects.

A case in point. I saw for the first time today a young married woman; had her first child six months ago. Since the birth of this child she has had trouble with her bowel. She has six or eight actions a day, and has imperfect control over her sphincter ani muscle. The actions are thin and mushy, but are never attended by any rectal pain and never contain blood or mucus. Usually she has griping pains in her abdomen just before the actions. Dietetic treatment and intelligent medication have been persistently practised by her physician in North Carolina.

On examination she shows nothing wrong about the rectum, no laceration of the vagina and no pelvic trouble of any kind. She

has had dyspepsia for years, but is not nervous. An examination reveals a freely movable right kidney.

To what must we credit her troubles? In what way could the traction of a movable kidney influence the action of her sphincter muscle? While constipation is the rule from the pressure of a displaced kidney, I can understand how traction and food stasis and fermentation may give rise to diarrhea. I can understand how diminished nerve-tone may lessen her control over her sphincter, and how this may be increased by the shock and trauma incident to labor.

The case illustrates the difficulty of associating cause and effect. I advised against nephrorrhaphy in this case, and my advice was concurred in by my colleague, Dr. Edward McGuire, who also saw the patient.

It would seem that the greater the displacement, the more severe should be the traction and consequent neurasthenia and gastro-intestinal disorders. Other factors than free mobility of the kidney contribute to the production of pain, poor health and kidney crises.

Extreme displacement and absence of symptoms have been contrasted with a similar condition in prolapsus uteri, in which the nerves were overstrained and the circulation in time adjusts itself to the changed condition.

Many factors other than those we have mentioned are capable of inducing gastro-enteric disorders. We have many examples of unimpaired digestion and the existence of nephroptosis in more than 50 per cent. of the cases observed.

Nephrorrhaphy for the relief of gastro-enteric disorder is limited by our inability to tell to what extent the disorder is due to renal ptosis *per se*, or to enteroptosis or to some one of the many well-known etiological factors of gastro-enteric disorder.

To what must we credit the condition of Dietel's or renal crises? To what extent does it induce suffering and poor health and endanger life? In what proportion of cases does it call for nephrorrhaphy?

At first, the cause of Dietel's or renal crises was supposed to be a twist or traction on the vessels of the kidney, inducing pain, vomiting, nausea, fever, soreness, etc., just as in the case of kidney, gall-tract, or appendicular colic. If the renal crisis is due

to traction or twist of the vessels, should we not have more traction and twisting, with great displacement?

I have a case under observation at this time which illustrates violent paroxysms in the beginning, and almost a cessation of attacks since the kidney has become so freely movable.

Several years ago I treated this delicate old lady for supposed frequent attacks of cholelithiasis. Every few weeks, or even oftener, she would have a violent attack of vomiting, nausea, agonizing pain, slight fever and soreness, lasting for several days, and once or twice a slight jaundice.

About a year ago I discovered a very movable kidney, and naturally changed my diagnosis from cholelithiasis to nephroptosis with Dietel's crises. Within the past year or two she had very few attacks, the last following free manipulation of the kidney by a brother practitioner, to whom I showed the case as one of wide range of movement with little discomfort. This case further illustrates how easy it is to mistake Dietel's crises for gall-tract and appendicular or renal colic from stone.

The tension or torsion theory of the bloodvessels is not accepted as the most rational explanation of the attack by a majority of observers. A very much more logical conclusion is that which attributes the attacks to flexion or twist or traction on the ureter. Obviously, this must result in the retention of the urine in the ureter and pelvis of the kidney, with violent colic, dilatation of the ureter and pelvis of the kidney, and hydronephrosis, usually intermittent, exceptionally persistent.

A further step in the morbid process is the infection of the retained urine inducing pyonephrosis, and possibly a disorganized kidney and death.

The association of movable kidney and hydronephrosis has long been a matter of common observation. Many cases of hydronephrosis, says Osler, "are in women, and associated with movable kidney." Dietel's or renal crises endanger health by the frequent attacks and by the dread of recurring attack. It endangers life by its tendency to induce intermittent hydronephrosis, and possible pyonephrosis. The tendency of Dietel's crises to induce such destructive changes becomes, in the opinion of some clinicians, such a serious matter as to call for nephrectomy. They claim that a kidney once so seriously damaged is permanently injured. Others

contend, I think legitimately, if the nephrorrhaphy removes and prevents torsion or kinking of the ureter, restored drainage will prevent or cure the hydronephrosis.

We have no statistics by which we may ascertain, even approximately, the proportion of cases in which we may expect Dietel's or renal crises. As far as we can ascertain, it occurs in a small proportion of cases; and if we had only to consider the discomfort incident to the attacks of pain, vomiting, nausea, fever, etc., which usually is over in twelve to twenty-four hours, nephrorrhaphy would have a limited application. Probably hydronephrosis and its possible sequelæ render operative interference more urgent.

It will probably be held that the benefits from nephrorrhaphy, as a rule, are too palpable to sanction skepticism. Within limits I am an ardent advocate of operative interference. The good accruing in many instances is very gratifying, but exceptions to this rule are by no means infrequent. Delvoie has collected 215 cases, of which 135 were cured, 30 improved, 25 unimproved, 20 relapses, and 5 deaths.

I repeat, my protest is not against nephrorrhaphy, but its abuse. It will not do to credit all the good to immobilizing a normally movable organ by sutures. The prolonged rest after the operation, preparation by dieting, etc., for and subsequent to the operation, may exert a beneficial effect. The moral effect of an operation should also be considered. Drs. J. William White and William H. Furness, in Dennis's *System of Surgery*, in commenting on Bruce Clark's series of cases of nephrorrhaphy, all of which were successful, remind us that "this is one of the operations in which, for some reason, great relief or complete disappearance of symptoms follows merely an exploratory incision." They quote instances recorded by Sir William Stokes, and conclude that possibly a kink in the ureter is removed in the manipulation. The incision in the capsule may relieve tension or divide nerves, the subject of lithemic irritation, and thus stimulate the movable kidney.

In conclusion, I think it can be claimed that *the limits of nephrorrhaphy have not been definitely defined, but should be, in order to limit needless operative interference.* We concede the frequency of nephroptosis, but contend that in more than a majority of cases

it does not destroy the comfort, good health, or life. We concede the value of nephrorrhaphy in properly selected cases, but deprecate the tendency toward operative interference merely because the kidney is movable.

DISCUSSION ON THE PAPERS OF Drs. CORDIER AND TAYLOR.

Dr. George Ben Johnston, of Richmond.—Mr. President: I had hoped to hear others speak on this subject previous to saying anything myself. It is one, however, in which I am greatly interested, and it is a field in which I have done a considerable amount of work. Some years ago my attention was called to it by encountering several cases of movable kidney that had been unobserved either by myself or by the medical man who preceded me in the treatment of these patients, that presented obscure nervous and gastro-intestinal disturbances; and when I observed the similarity of symptoms in the first three cases which I saw I was finally obliged to associate those symptoms with the presence of movable kidney. I prevailed on these women to be operated upon for movable kidney, and in all three cases the results were most gratifying.

This experience caused me to look more deeply into the subject, and I soon discovered that other observers were finding movable kidney much more frequently than the men with whom I came in daily contact. I made my searches more diligent, examining every woman with reference to movable kidney that came to me, and I was astounded at the number I discovered. I pretty soon found that a great many cases in which the kidney was movable presented symptoms that were referable in no manner to movable kidney. I found that many women had movable kidney who were not cognizant of the presence of it, and were without any symptoms that I could attribute to movable kidney. On the other hand, a great many women had symptoms that could not be accounted for by the presence of any other pathological condition that I could discover by the minutest examination. There were no lesions of the pelvic organs; no lesions of the perineum; no organic diseases of the nervous system nor of the digestive apparatus. There was nothing that I could find that would answer or account for the presence of the peculiar symptoms with which such women suffered except movable kidney. Therefore, I felt that inasmuch as I could discover nothing beyond the presence of movable kidney to account for the

symptoms present, an operation for the relief of this condition was justifiable, and I did many of these operations. A great many of them were not only successful, from a surgical standpoint, but successful in that the symptoms for which the operations were undertaken disappeared.

As my experience grew I continued to find movable kidneys more numerous than I had ever dreamed they were, and now in my experience it is the commonest possible occurrence to find movable kidney. Rarely a week passes that I do not discover one. Many of the women have absolutely no symptoms, and they are passed by without mention being made of them to their possessors. In my case-book an account is kept of them, but the individual possessor of movable kidney is not apprised of its presence. I am prepared to believe, from my own experience, that anyone who has kept statistics as I have has noted the frequency of movable kidney. I believe it is within the bounds of correctness to assert that twenty out of every one hundred women who come to us for gynecological examination have movable kidney. I am prepared further to say that perhaps not more than one-fifth of these are cases in which surgical interference is required.

The operation for anchoring the kidney is exceedingly simple—one entirely free from danger; and a movable kidney furnishes such an abundant pretext for an operation that we are tempted to operate oftentimes when it is not demanded. I wish to join Dr. Taylor in his protest against such a measure as this. I do not think that any operation for the fixation of a kidney should be resorted to, simply because the operation is an easy one and because some possible relief may be obtained, until all other means have been exhausted. For instance, we should make a thorough search for any other pathological condition to which symptoms can be referred; then that condition should be overcome. When it is proven that such interference will not cure the patient nephrorrhaphy may be resorted to. The operation should be limited to such cases as have symptoms that are referable to no other possible cause.

Some of the most distressing conditions that I have ever observed have been in women with movable kidney. They have had the gravest sort of nervous complications; they have had the most serious disorders of digestion; they have had attacks simulating appendicitis; they have had crises that were so severe as to induce the belief that a renal calculus was passing; they have had menstrual disorders—in a word, all sorts of manifestations that could not be accounted for except on the ground of the presence of movable kidney, because many of them had no other apparent pathological lesion.

It is to this class of cases we ought to direct our attention and to which we ought to offer surgical relief. In the vast majority of cases a judicious, well-directed attempt to fix the kidney by the ordinary methods that are in vogue will succeed, and with the success of the operation comes the cure of the patient.

I would warn all of those gentlemen who have not had ample experience in this field of surgery that they must not expect too prompt a cure of their cases. That has been my experience, and I have now come to state it to patients who fall into my hands for nephrorrhaphy that they must not expect a cure within at least three, possibly six, and perhaps twelve months. We must not lose sight of the fact that many of the cases have existed for a long period of time—months, perhaps years—and certain changes have taken place in the kidney structure and in the organs which are influenced by the movable kidney; and that even after the kidney is fixed in its normal position and the case is surgically cured the subsidence of the symptoms must be very gradual; hence a long period of time is often required to cure these cases. I have many times had cases return to me at the end of one month and say, "Doctor, I am no better; the operation was a failure," whereas at the end of another month they will come back and say, "I feel a little better; my constipation is relieved; I do not suffer so much as I did from accumulations of gas; I do not feel that sensation of weight and drawing that I once did; I walk a little more comfortably." At the end of the third month these patients are sure that they are much better; at the end of the fifth month they are a great deal better; and when six months have expired a cure has generally taken place. This is the class of cases that we must caution at the outset, informing them that the cure will not be a rapid one.

I have had no greater satisfaction in my surgical experience than in the treatment of a certain number of cases of movable kidney. I have had a number of failures; in some instances I have failed to get the kidney to remain fixed. It would remain for a month or two months, but would begin to become movable. These cases are not frequent, but they have occurred. I have had some cases in which no benefit at all has been derived from the operation, but in the vast majority of instances the benefits have been lasting, and it is an operation to which I have pinned my faith—one which I shall continue to perform as long as the results are so satisfactory as they now appear to me.

Dr. L. H. Dunning, of Indianapolis.—I feel greatly interested in this subject, for the reason that in the early eighties I resorted to operative procedures for the cure of floating kidney, and in connec-

tion with this work I sought to determine, if possible, some of the causes which lead to movable kidney. I desire to emphasize the importance of differentiating between floating and movable kidney. The former is always congenital, while the latter is acquired to a greater or less extent. I have made a careful examination of the kidney, with its surronndings, in the dead-house, on animals and upon the living subject, and I soon discovered that a partially fixed kidney would depend upon three or four canses, the two chief of which were: first, its position behind the peritoneum; and, second, the fact that it had an envelope of perinephritic cellnlo-adipose tissue. A little further investigation showed that this perinephritic cellulo-adipose tissue was composed of two parts—one fixed, the other movable. The fixed part, lying against the posterior wall of the abdomen, served as a cushion upon which the kidney rested, and the movable portion completely enveloped the kidney. Furthermore, I found that the kidney, when in a normal condition, had a range of motion of from one-half to three-qnarters of an inch in its fatty envelope. Beyond these limits the kidney wonld not move, when in a normal condition, because there was an obstacle in the way of its being displaced farther than this. I also discovered that by intermittent effort it was possible to elongate the movable portion of the fatty envelope so that the kidney could be displaced one or two or even fonr inches without ruptnring the fatty envelope. I have repeatedly demonstrated this fact, and I think it accounts to a large extent for the movable condition of the kidney.

In regard to nephrorrhaphy, I have done the operation about twenty times upon selected cases, and I have found great benefit from its use; but I think surgeons will have to limit the operation to snitable cases if they wish to obtain any benefit, especially to cases of intermittent hydronephrosis, to those in which there is present obstinate constipation which cannot be referred to other causes, and to those cases in which obstinate vomiting comes on periodically and the kidney is undergoing a comparatively wide range of motion. I have no faith in the use of pads or bandages for the treatment of movable kidney.

Dr. Walter P. Manton, of Detroit, Michigan.—I have never done the operation of nephrorrhaphy. Some fifteen years ago, shortly after Landois published his work, I believe, I became interested in the subject, and I have been looking for a case to operate on ever since. I once saw a case that I thought was a fit snbject for the operation, and while the patient was making up her mind to undergo operative interference she heard of some sort of mechanical exercise for the relief of movable kidney, which she tried, and whether or not this had any

effect upon her I do not know, but I subsequently learned that the woman had become perfectly well, and is well today. I do not want to say, in the face of what has been said today, that there are not cases of movable kidney where nephrorrhaphy is indicated, but I have never seen a case myself that has not yielded to other methods, and I shall be glad to find one on which I can operate.

While I have never used Dr. Dunning's pad in these cases, I have employed in a number of instances a bandage, sometimes with and sometimes without a small pad; but whether or not that has any effect in restoring the patient to health I do not know. But I do know, in all the cases I have seen, the women have been emaciated, generally subjects of neurasthenia, many of them hysterical; and as soon as they were built up physically—as soon as an accumulation of fat, of which Dr. Dunning has spoken, took place around the kidney—these patients have been relieved of their symptoms, whether the kidney trouble was relieved or not. I believe, in the vast majority of instances of movable kidney, that the good effects resulting from surgery are not so much due to the operation itself as to the conditions referred to by Dr. Taylor in his paper—namely, rest, diet, and the after-care of the patient.

Dr. Thomas B. Eastman, of Indianapolis (by invitation).—I have listened with a great deal of interest to these papers, and particularly to that of Dr. Cordier, in which he details with great distinctness the differential diagnosis between trouble with the appendages and floating or movable kidney. I think the distinction is a very important one, and I wish to detail briefly a case which will perhaps bear me out. A woman, twenty-five years old, came to me with several symptoms of appendicitis. She also had a considerable amount of albumin in the urine. After applying many of the points which Dr. Cordier has mentioned I was still left in doubt as to what the trouble was. An operation later on showed that the appendix was very firmly adherent to the kidney. It took considerable force to liberate it. As soon as it was freed the kidney bounded back into place as if on a rubber band. The appendix was removed, the albumin in the urine ceased, and the woman made an uneventful recovery.

Dr. James McFadden Gaston, of Atlanta.—I have been hunting all my life for floating kidneys to anchor them in place. A distinguished gynecologist, as some of you will remember, in searching for the kidney found a gall-bladder and attached it to the lumbar region, and when the case developed into a more definite form of gall-bladder surgery he had to operate on the gall-bladder and found he had stowed away the gall-bladder when he thought he had the kidney.

I will say that my experience has been *nil* in operative measures for

movable kidney. I have had occasion to see some of these cases, and I think the liability to mistake an enlarged gall-bladder, which becomes relaxed and drops, for a floating kidney is very great. In several cases which I have had occasion to deal with of this kind, but for the case I have alluded to staring me in the face, I think I should have had some misapprehension about the gall-bladder. The latter is capable of being pushed back into the lumbar region and carried around in front in just the same manner that an alleged floating kidney can be carried about, and I think it behooves gynecologists especially to look to that phase of the matter.

Dr. W. E. B. Davis, of Birmingham.—When this question was under discussion two years ago at the Charleston meeting of the Southern Surgical and Gynecological Association there was quite a difference of opinion as to the frequency of the condition. I think Edebohls is correct as to the frequency, but believe that only a small per cent. require operative interference. Of a large number of cases which I have had under observation I have only done a few operations to anchor the kidney. However, it is a simple procedure, and if you should do an unnecessary operation you have not subjected your patient to any great danger. The symptoms of neurasthenia, with disturbance of digestion, etc., have been pointed out by the essayist, and when such patients are put upon the Weir Mitchell treatment a great many get well. In some cases it takes months or years after a case has been operated upon to be cured, which would show that it is the treatment which is directed to the nervous system that relieves many cases. Some have claimed that movable kidney often causes gallstones and appendicitis. It is the condition of the mind and nervous system which we find associated with movable kidney, and not the movable kidney, that produces catarrh of the stomach and intestines, as well as of the appendix and bile-ducts. Yet if the kidney has become movable and has a large range of motion, it must necessarily add to the irritation in these cases, just as a badly displaced uterus adds to a nervous condition; and inasmuch as the operation of nephrorrhaphy is devoid of danger, in cases not relieved by general treatment, it is wise to fix the kidney, for the same reason that one would operate on a displaced uterus. It would relieve a certain part of the irritation, and thus assist in curing the patient.

As to the question of diagnosis brought up by one of the essayists, I believe with Dr. Gaston, that we should be careful to differentiate between movable kidney and a distended gall-bladder. Ordinarily, there will be but little difficulty in this regard, but a gall-bladder that becomes adherent would be hard to distinguish from a kidney with

perinephritic inflammation. I have made such a mistake three times. Where we have simply a movable kidney or an enlarged movable gall-bladder with gallstones to deal with, there is not much trouble in making the diagnosis.

Dr. I. S. Stone, of Washington, D. C.—I have had only a limited experience in cases of movable kidney—not so much as some of the gentlemen who have spoken. I have operated on six or eight cases. We have the history of Battey's operation for removal of ovaries, and many women were cured by such an operation who really did not need oöphorectomy; but it required that experience in order to teach us what we know, and out of this work done on the kidney some good will be evolved—something that will not only teach us the causation of the symptoms, but perhaps enable us to do away with the operation. I believe surgical science will be a great failure if we do not learn by preventive medicine, as hinted at this morning. If these operations upon the pelvic and abdominal organs keep on in the proportion they have been, it will certainly do away with medicine altogether. We want to leave medicine some place, and let it be understood that surgery is only a *dernier ressort*.

In regard to the success which attends the operation of nephrorrhaphy, we can cure women who have been sick for years, having all of the symptoms which suggest the Weir Mitchell treatment, and cure them after a time by this operation. After nephrorrhaphy I have seen women with all of the symptoms referred to gain twenty-five to forty-one pounds in weight and a rosy color brought back to their cheeks. Besides giving the Weir Mitchell treatment I would make an incision in the loin and do something to the kidney in addition. I have never seen better results from surgery in cases were nephrorrhaphy was resorted to unless it be after the removal of ovarian tumors. Sometimes there is the most rapid improvement in such cases, and I do not know of anything equal to it. I have reported half a dozen such cases, which conclusively show that we cannot place any reliance upon the woman's symptoms, but we do get exceptionally good results after nephrorrhaphy. I do not feel that I am justified in consuming any more time in discussing these papers. I have been very much pleased with Dr. Cordier's paper, and I commend it very highly, although I cannot accept all his conclusions. As for Dr. Taylor's paper, it is exceedingly moderate and conservative, and I do not see how anybody can take any exception to it.

The President.—My experience in stitching or anchoring kidneys has been limited. I have not had sufficient time at my disposal to stitch kidneys, or probably I would have stitched a great many more.

But I would like to say in reference to stitching kidneys that, whether the case occurs in a fashionable society woman or a woman in the lower walks of life, we often find that movable kidney causes considerable discomfort, and if you anchor the kidney you will do what Dr. Stone has said, in a great many cases—namely, increase the weight of the woman twenty-five pounds and make her again a useful person. I am satisfied, however, we can go too far in cases of movable kidney, and it seems to me a halt should be called in a procedure of this kind. Dr. Johnston's experience has been that nephrorrhaphy affords relief in a great many of the cases. Dr. Taylor has made a similar statement, and none of us has a right to question their statements, and I am sure, too, they will not doubt our motives in the attitude we assume toward the operation.

Dr. J. Henry Carstens, of Detroit.—I agree with the gentlemen who have preceded me, that there must be a line drawn between a movable kidney and a floating one. I think the former cases give very little trouble. The trouble we get from a floating kidney is often due to a twisting of the ureter and causing obstruction. What has been the perplexing question to me is this: Why should some women have all of the nervous symptoms accompanying movable kidney and others with movable kidney have absolutely no symptoms at all? This is what we want to find out. I have seen cases, such as Dr. Stone has referred to, that after operation were followed by the most remarkable results. The most brilliant results attend anchoring of the kidney. Where the neurasthenia goes hand-in-hand with movable kidney I think one is perhaps dependent upon the other. There is undoubtedly a weakened condition of the nervous system which causes relaxation, and the kidney gets a little start, becomes worse and worse, and probably gets twisted. But the principal point I want to bring out is this: We do not always have success; the kidney does not stay in place, and this has done more to discourage the operation in my hands than anything else. I have heard a great many physicians say that it does no good to stitch up the kidney; that it does not stay in place long.

A couple of years ago I had a patient suffering from hydronephrosis of one side, and on account of compensatory enlargement of the kidney on the other side I thought I would do two operations. I removed the right kidney and stitched up the other, and in about six months the kidney got loose again. I was disgusted.

A physician brought his wife to me; she had had two attacks of appendicitis. She also had chronic ovaritis and salpingitis. I operated on her, removed the uterine appendages, next the vermiform appendix, and finally stitched the kidney in place. I did a

very thorough operation, and she was the picture of health in a short time; but about six months afterward the kidney became loose, and all of the old symptoms returned. I made up my mind then that I was not going to do any more kidney stitching until I knew of some better method. Finally, I attended a meeting of the Canadian Medical Association and saw on the programme that a physician from Sarnia would read a paper on a new method of anchoring the kidney. This was what I had been looking for. But the doctor was not present; consequently his paper was not read. I subsequently met the doctor and said to him, "You can tell me how you anchor movable kidneys," which he did. (Here Dr. Carstens demonstrated on the blackboard the method of anchoring the kidney, by resecting the capsule in a Z-shaped manner and securing each triangle to the muscle and fascia.)

Dr. Richard H. Gibbons, of New York (by invitation).—The up-to-date operation—the new wrinkle, as Dr. Weir calls it—for holding the kidney in place in its newly-made position is destined to be successful. Dr. Poulet, of Lyons, and a friend of his, whose name I cannot recall, from Switzerland, several years ago devised this operation and carried it into effect. A short time since they detailed their experience with the operation, although they have only operated on a few cases. The operation is to expose the kidney in the regular manner, and drag it up in the wound, place about it a strip of intermuscular septum dissected out from the neighboring muscles, and wrap it about the kidney, making a loose knot to hold the kidney in position temporarily. Just why that procedure is carried out I cannot understand. I cannot appreciate the necessity therefor. Then the wound made, after exposure of the kidney and bringing it up in this position, is closed temporarily by hemostatics. Another wound is now made half an inch to the outer side of the kidney, posterior to the first lumbar vertebra, and the aponeurosis of the quadriceps lumborum is opened and exposed; then pushing aside the fibres of the muscle you come down to the erector spinæ muscle or tendon. By means of a blunt hook or needle the tendon is lifted up by two or three fingers to the spine of the scapula, and then by making traction you have a tendon twelve inches in length. The fingers are passed to the bottom of the newly-made wound; the tendon is passed through the structure of the kidney, which is lifted up; the capsule of the kidney is perforated by a small-sized flexible sound or probe, to which is attached a piece of string, and then the tendon is pulled up and put through the kidney at its upper portion, at a place back of the capsule, between the kidney and the capsule itself; then it is brought back again and brought up through the position between the first lumbar and the last dorsal

vertebræ, and so brought up through the last-made wound and stitched fast and the kidney held there. The kidney has been found in post-mortem examinations on animals to remain there for eighteen months.

In Volume I. of the *International Clinics* for this year a diagram was given of the kidney of a dog which was attached and held in position in this way experimentally. There is no other method with which I am acquainted that will keep the kidney in place. The stitches that are inserted by various methods for the purpose of holding the kidney in place all give way. Edebohls opens up the capsule of the kidney and turns it outward beneath the fascia transversalis and fastens it, and in this way gets adhesions to the capsule of the kidney and likewise of the kidney structure itself; but according to my own impressions and the limited experience I have had I have never felt I could do any good by the usual methods of operating; but I believe this operation I have described is destined to become useful.

Dr. Cordier (closing the discussion).—In the first place I desire to thank the members for discussing my paper so freely. I am a little surprised at the position taken by Dr. Manton in reference to this matter. In an institution not far from the city of Detroit I learned from a gentleman with whom I was talking last week, and who had been there, that he saw seven movable kidneys anchored in one week.

Dr. Carstens.—It is one hundred and fifty miles from Detroit.

Dr. Cordier.—I am not surprised to hear Dr. Carstens say that the kidney does not stay in position. As long as he continues to use kangaroo-tendon or catgut for anchoring movable kidney just so long will the kidneys get away. In this locality, especially next to the stomach, the kidney will digest absorbable material very quickly, and catgut and kangaroo-tendon are absorbed within a few days after their application. I use silk now altogether—Chinese twist—and if you use silk in these operations you will get better results. I use as many as three stitches. I must comment on Dr. Stone's position in this matter. I remember distinctly that in his recent article he used one stitch in holding the kidney in position.

Dr. Stone.—I did at first, but subsequently I used more stitches.

Dr. Cordier.—At least two or three stitches should be placed, so that the kidney will not revolve upon itself.

Dr. Carstens.—Do you leave the silk in?

Dr. Cordier.—Yes. I sometimes split the capsule a little bit on the convex surface and leave it open. The best needle, I think, is the one originally devised by Martin for doing the operation of staphylorrhaphy. I am surprised no one has said anything about taking hold

of the kidney with a flat instrument like this. (Here Dr. Cordier exhibited an instrument.) As soon as you are through the fatty capsule and have reached the kidney this instrument is inserted, the kidney quickly seized, and then you turn the instrument over to your assistant. It is impossible to do injury to the kidney. This is a placental forceps bent so as to assume this shape, and it does its work admirably.

In regard to the symptoms: you can make a diagnosis of movable kidney by the symptoms as to whether the case is an operative one or not. If a woman is unable to be on her feet, has an uneasy sensation in the right side, and on assuming the recumbent position this uneasiness disappears, an operation is called for. But I said in my paper you must not rely on symptoms entirely in making a diagnosis, for every case of movable kidney should not be operated upon. Every one of them will present symptoms of movable kidney, and there is no operation that affords greater relief to the patient and greater gratification to the operator than that of nephrorrhaphy.

TREATMENT OF PERI-UTERINE SEPTIC DISEASES.

By W. E. B. DAVIS, M.D.,
BIRMINGHAM.

Only recently has the extremely radical procedure of hysterectomy been practised in this country for septic diseases of the internal genitals. A wave, which had its origin in Paris at the hands of Péan, aided by Richelot, Segond, Jacobs, and others, reached our shores three years ago, and has found a considerable following among our leading operators. There has been much rivalry for some years in this country as to who could do the largest number of hysterectomies most successfully; but I will not say that it is possible this innovation was much more readily embraced, as it afforded great opportunity for such ambitious ones, who had almost ceased to be interested in the more simple operation of salpingo-oöphorectomy, to increase their cases of hysterectomy more rapidly. They claim that there is no use in leaving the uterus behind after the removal of the appendages; that "in every operation for septic diseases of the generative organs which demands the removal of the tubes and ovaries hysterectomy should also be performed, unless there are plain contradictions forbidding it."

It should be the aim and pride of the surgeon to preserve everything consistent with thorough surgical work, and not to sacrifice important organs because it can be done with only a small mortality. We are told that the uterus has no function after the removal of the appendages, but this has not been demonstrated; while, on the contrary, we know that the sexual life of the woman is very much better preserved by leaving the uterus, and that the mental effect is also much better. A slow convalescence, or even a second operation, is preferable to its removal, unless very much diseased. It is a reflection on the correctness of the reports of complete recoveries of such a large percentage of cases by many

most excellent surgeons, when the uterus was not removed, to accept the argument now being used in favor of hysterectomy in all these cases. As stated at the last meeting of the American Medical Association, "I cannot agree with Dr. Sutton and others that pus in the tubes is due to gonorrhea in 75 per cent. of cases. I think that puerperal infection is the cause of more than 50 per cent. Tubercular infection is rarely the cause, and is not so important as has been claimed. However, the importance which has been attached to gonorrhea is against the argument for the removal of the uterus, as the infection from this source is not deep and can be removed with the curette. Because some patients are not completely cured by the removal of the appendages is no argument for hysterectomy in every case where the bilateral operation is required, for nearly all these can be relieved by a thorough curettage. Some large uteri will require, in addition to this, a high amputation of the cervix. Only a small number will need a hysterectomy."

It is a notable fact that some of the surgeons who claimed most for curettement of the uterus a few years ago, and who taught that total ablation of the appendages was seldom necessary, are now the most enthusiastic advocates for hysterectomy. It is granted that there are some cases in which it is best to remove the uterus, notably those in which the uterus is flaccid and its walls infiltrated with pus, surrounded with pus-tubes and ovarian abscesses. Tubercular infection of the uterus, too, is sufficient cause to require its removal. Extreme injury and mutilation of the organ in removing the tubes and ovaries would also call for the operation.

Vaginal incision for the drainage of pus in the pelvis, not confined to the tubes and ovaries, has been practised for a long time with very gratifying results. This procedure is so old that it is hard to say when it was not resorted to. Such cases would recover, almost without exception, from the immediate attack, and a large number recovered completely and bore children afterward. This result was due, of course, to the drainage of the tube or ovary through the peri-tubal or peri-ovarian abscess, just as cases of appendicitis are cured by the rupture of the diseased appendix, producing an abscess, which is evacuated by the surgeon, the appendix being drained through the abscess. In cases of abscess from lymphangitis and phlebitis this treatment was all that was required, but cases of abscesses due to the tube or ovary were not all entirely

relieved, due to the fact that the pus-tube or ovarian abscess was not drained satisfactorily. More recently pus-tubes and ovarian abscesses have been incised and drained through the vagina with permanent recoveries in a good proportion of cases. These are the very cases where the vaginal operation and hysterectomy have been recommended so highly by the French surgeons. Yet a large percentum of these cases can be relieved by vaginal incision and drainage. If not relieved, the patient's condition will be made better by getting rid of the pus, and later on an abdominal operation can be done and the patient cured by the removal of the appendages—and perhaps from one side only.

The French surgeons in some cases, when unable to remove the diseased tubes and ovaries after hysterectomy, have been contented to open the masses containing the diseased appendages, and to pack with gauze. The drainage in such cases has brought about complete cures The same result could have been accomplished without the removal of the uterus, by vaginal section and the breaking up of adhesions, with drainage. I would not be misunderstood as believing that all cases can be cured by incision and drainage, but so large a percentum can be relieved, without the loss of the uterus and adnexa, they should be given the benefit of this conservative procedure before more radical measures are resorted to. Especially should this be done in young women, to whom the loss of the appendages and uterus means the loss of so much that is necessary to their happiness. This treatment has been highly commended by Henrotin, Pryor, and Kelly, and my own experience with it has been so satisfactory that I am convinced of its great value and the necessity of its more general adoption. The following is the plan I have adopted:

Peri-tubal and peri-ovarian abscesses. When there is a considerable collection of pus and the patient is suffering from marked sepsis, the uterus is not curetted and no attempt is made to find the tube or ovary. An incision is made into the abscess, hugging the posterior uterine wall, and after thorough irrigation gauze is packed into the cavity, the vaginal incision being well filled so as to keep a large opening to permit of the escape of any collection that may occur in the cavity. The vagina is also filled with sterilized gauze. The gauze in the vagina is removed in twenty-four hours, and from the abscess-cavity in forty-eight

hours. A rubber tube is introduced into the abscess-cavity at the end of a week and kept in place from four to eight weeks. Douches are given twice a day after the removal of the gauze from the vagina. Water is passed through the tube twice a day. Carbolic acid may be used with advantage in the wash. In small peri-tubal and peri-ovarian abscesses the same treatment should be adopted as in cases of tubal and ovarian abscesses, which I will describe. If there is a considerable mass some weeks after the drainage of large pelvic abscesses (peri-tubal and peri-ovarian abscesses), the same treatment will be indicated as for tubal and ovarian abscesses.

Tubal and ovarian abscesses. In these cases the uterus is always curetted and carbolic acid applied to the cavity. The cervix is grasped by a strong vulsellum forceps and pulled down and lifted to the front. An incision with scissors is made in the posterior vaginal wall, hugging the cervix, and large enough to admit two fingers. When the peritoneum is reached the mass or masses can be easily outlined by bimanual palpation and can be opened with scissors or uterine forceps, the finger being used as a guide. The cavity is thoroughly dried out with gauze and irrigated. If the general abdominal cavity is entered, it is best to make the opening large so as to prevent a secondary abscess. Gauze should be packed into the cavity, a large quantity being used in the vaginal incision. The vagina should also be packed with gauze. The gauze is removed from the vagina in forty-eight hours, and from the abdomen and the tube in five or six days, except the withdrawal of a few inches each day, to keep the vaginal opening patent for the escape of fluid. A rubber tube is introduced after the removal of the gauze and managed as directed for peri-tubal abscess. As Henrotin says, "It seems only reasonable that such operations may be successful, even in the most chronic forms of pyosalpinx. What happens in such cases? Septic material, travelling up the Fallopian tube, when the process is not too rapid, finds itself arrested at the abdominal opening by a closure of the ostium abdominale. An abscess-cavity is developed in the walls of the tube proper. After a ime the uterine end becomes closed, and then we have an independent pus-sac, not communicating with either the serous or the uterine cavity. This may rupture into the folds of the broad liga-

ment and work its way toward the vagina. If widely opened and drained and packed, after a time all the so-called pyogenic lining membrane disappears, granulations fill the gap, the Fallopian tube becomes obsolete, and the patient is cured."

Hydrosalpinx and hematosalpinx should be dealt with as outlined for pyosalpinx. I have treated cases of ectopic gestation by this method, and was recently consulted by a young woman who had become pregnant in the uterus after recovery from such an operation for pregnancy in the right tube. Pelvic masses following an abortion or delivery at term should be treated in this way. Pus should not be waited for. I have treated a good number of such cases by incision and gauze-packing before pus-formation, and thus cut short a protracted illness.

I have operated by the vagina a few times in cases where the uterus was retro-displaced and bound down by adhesions. The adhesions were broken up, the uterus replaced, the tubes and ovaries lifted up and gauze-packing resorted to as heretofore described. The results so far have been quite satisfactory, but I am of the opinion that a large number of such cases will require salpingo-oöphorectomy before they are entirely relieved.

When double salpingo-oöphorectomy is necessary the choice of operation will depend largely upon the decision as to the disposition of the uterus. If the uterus is to be removed in such cases, the vaginal route could be adopted with advantage in a good proportion of operations. Fortunately, that is not necessary, and hence the abdominal operation is preferable, as the aid of positive sight is given, thus affording a wider field of operation and an opportunity for conservatism.

SHALL HYSTERECTOMY BE PERFORMED IN INFLAMMATORY DISEASES OF THE PELVIC ORGANS?

By L. H. DUNNING, M.D.,
INDIANAPOLIS.

A CONSIDERATION of puerperal sepsis and tuberculous peritonitis shall be excluded from this paper. We shall discuss only that form of inflammation of the pelvic organs and tissues denominated diffuse pelvic inflammation. By thus limiting our paper we will avoid many moot questions which must be settled before any definite conclusions can be reached.

It is unfortunate that such expressions as "making a clean sweep of the pelvic organs," "cleaning out the pelvis," "removing everything," "after the menopause the uterus is worse than a useless organ," should have found a way into the discussion of this subject.

These catch-phrases, like the metaphors of the demagogues, are by many seized upon as expressing the final conclusions of our wise men, our masters. If not intended to be uttered in this sense, they are yet taken up and used as a rallying-cry by the devotees of the extreme hysterectomists. A catch expression, though it may be false, may be so frequently and dogmatically repeated as to become cogent in moulding public sentiment. Emmet has well said: "It requires ten times as great an effort to eradicate an error as to establish a new truth."

A long time after a new principle or method has become obsolete with the master the disciple will hold to it and be influenced by it; and frequently, too, a meaning is given an expression never intended by its originator. Such, indeed, I am persuaded, has been the case with those mentioned above.

It is now only in septic cases that the greatest number of hyster-

ectomists would have the dangerously diseased uterus removed in inflammatory cases, yet many of the laity and many physicians have extended the method to all obscure cases of pelvic disease which, though mildly inflammatory in character, do not result in suppuration.

These remarks are called forth because the writer has during the past year been consulted by quite a number of patients who have been examined by several physicians, some of whom have expressed the opinion that only a clean sweep of the pelvic organs would afford them any relief. He has, furthermore, had referred to him four or five patients sent by intelligent and progressive physicians, the patients bringing letters from the physicians in which it was stated that the patients had been advised that hysterectomy, with complete removal of the diseased organs, was the only promising means of cure. In but one of these cases was there a suppurative process going on in the pelvic tissues.

That hysterectomy in inflammatory disease of the pelvic organs resulting in suppuration is sometimes indicated will be generally admitted, but that it is the preferable method in the larger number of cases few will at present claim.

Since Henrotin[1] in 1895 announced the dictum, "In every form of septic disease of the female generative organs which demands the removal of the tubes and ovaries hysterectomy should be performed, unless there are contraindications forbidding it," the contraindications have gradually appeared, so that in the future there will not be so general an onslaught upon this central organ of the reproductive system in women.

Let us consider somewhat in detail some of the chief reasons advanced by the leaders of the movement for total castration. The dictum has been stated above that in all cases of bilateral purulent disease of the uterine adnexa demanding extirpation of these organs the total extirpation of the uterus should also be accomplished, unless forbidden by contraindications. The chief reason for including hysterectomy in the operative means employed in such cases is that by this means alone can we hope to cure the greater number of patients. In justification of the complete extirpation of the organs of a great system in the economy

[1] The American Journal of Obstetrics, June, 1895, p. 771.

of woman, they claim that hysterectomy is not attended by any increased risk to the life of the patient over bilateral extirpation of the uterine adnexa by the abdominal method; fewer accidents occur; the patient makes a more rapid recovery; and the uterus, if left behind, is of no use to the woman, indeed is an emasculated uterus, and is, furthermore, under such circumstances simply "a cloaca for the origin of hemorrhage, the accumulation of discharges, and the development of malignancy."[1]

It is pertinent to inquire whose experiences have been interrogated in arriving at the conclusion that the extirpation of suppurating tubes and ovaries in appropriate cases is not effective in curing the patients. Is it Tait's or Price's, Martin's, Hegar's, Pozzi's, and a host of others nearly as great, and others of lesser distinction? These eminent men all tell us that in a large percentage of cases their patients not only recover from the effects of the operation, but that they ultimately regain their health.

I would ask the members of this Association, What has been your experience in dealing with these cases of inflammatory disease of the pelvic organs? When there have been gross lesions of the Fallopian tubes and ovaries, what have been the results in the recovery and cure of the patients by bilateral extirpation of these organs? The writer's experience has been much less than many of yours, but in a summary, made by him a few months ago, of one hundred and sixteen consecutive cases in which he operated for purulent accumulations in the uterine adnexa by abdominal section and extirpation of the adnexa, seven proved fatal. Of the remaining one hundred and nine all but twelve eventually completely recovered, and of the twelve, three or four were gradually improving. Of the remaining eight, three had septic uteri which he failed to cure by curettement and subsequent treatment. These uteri should be extirpated, but in the other cases, so far as he can see, the uteri are normal.

Quite as many unrelieved and distressing symptoms have presented themselves subsequent to the eighty-four hysterectomies performed by the writer.

The purpose of the removal of the uterus by the vagina, it is stated, is to afford a safe and free access to the pelvic cavity, to

[1] Op. cit., p. 771.

afford superior drainage, and to remove a hopelessly diseased organ. The freedom from danger lies in the fact that the abdominal cavity is not invaded, the intestines are not subject to traumatism or exposure to infection. It is true that these advantages at times are marked, yet in no small percentage of pus cases the intestines and omentum are pulled down into the field of operation, and not infrequently are they handled and even torn through in the effort to liberate adhesions. Adherent pus-tubes are more prone to be ruptured by this method, and, furthermore, not infrequently some of the most important and deleterious features of the case are not discovered, such as adherent and obstructed intestines, the presence of perityphilitic abscesses and of tuberculous peritonitis.

The advantages and disadvantages of vaginal hysterectomy so nearly counterbalance each other that it is still a mooted question which is the better way, the abdominal or the vaginal. In the former method some operators will drain from below, some from above, and some not at all. Yet the mortality of abdominal hysterectomy is quite as low as when the lower method is employed.

This is a complete and unanswerable argument against advantages accruing by the lower way in consequence of its affording a better means of drainage. The truth is, vaginal hysterectomy by the clamp method always demands a means of drainage because of the sloughs and foul discharges following the operation. Salpingo-oöphorectomy yields as free access to the abdominal and pelvic cavities as abdominal hysterectomy, and must even remain slightly less dangerous to life in parallel cases by the same operation.

The burden of proof lies with the advocates of total castration as to the truth of the statements that the presence of a hopelessly diseased uterus is the cause of so many unpleasant symptoms following bilateral castration, and that this diseased uterus is a cloaca for hemorrhage, foul discharges, and malignancy.

The laparatomists have established unilateral and bilateral extirpation of the appendages by proof of its efficiency, and not by a mere statement "that to all the patients, or mostly all, health has entirely returned." [1]

[1] Jacobs: op. cit., p. 737.

We can all call to mind the bitterness with which Mr. Tait was attacked in his earlier operations, and how he was repeatedly called upon for proof of his statements. You will remember, too, how he furnished dates, consultants, places, etc., thus enabling any doubter to verify or disprove his statements.

I have nowhere seen a detailed account such as his of any considerable number of cases showing the after-effects of the operation, either in respect to the cure of the patient or the frequency of the development of cancer in the so-called cloacæ.

Peterson[1] has forcibly drawn attention to the necessity of the microscopical and bacteriological examination of the uteri removed by hysterectomy, in order that more definite conclusions as to indications for treatment may be established.

Bayard Holmes[2] is, so far as I know, the only American investigator who has published the results of such systematic study, and his studies relate to the effects upon the uterus of puerperal sepsis. They reveal much of importance and strongly fortify the conclusions he draws.

A few cases have been reported in which after bilateral extirpation the uterus has remained a source of disease and its removal has wrought a cure. The method should have full credit for these cures. They are, however, highly exceptional cases and cannot form the basis for the establishment of a broad principle.

These uteri found subsequently diseased are from those cases in which septic uteri existed at the time of the operation and subsequent treatment has failed to effect a cure. It is in this class, if any, that total castration should be employed.

Now, what are the facts regarding the subsequent condition of the patients when total castration has been performed?

Physiology teaches us that the great systems of the physical man are interdependent and all essential to his highest development; that there is a harmonious movement in the development and decline of each individual. The law of progress of the whole by the harmonious action of each part is a well-established physiological law. The application of this law is that no part of a system, especially the central organ of a system, though we cannot

[1] Journal of the American Medical Association, August 8, 1896, p. 296.
[2] Op. cit., November 23, 1895.

at the time determine its office in the economy, should be wantonly sacrificed. Only a dire necessity can justify such a sacrifice.

Again, another law of physiology is cyclical movement. "The great periods of life are marked by characteristic and palpable changes. There are culminations and declines of functions and faculties." This is nowhere more apparent than in the reproductive system of woman. Let it be observed that in the normal condition after the decline there can nowhere be discovered decay. Every organ of the body serves a purpose, whether during the period of its functional activity or after its decline. No man can truthfully say that after menstruation ceases the organs of the female reproductive system are useless. They are necessary to the complete evolution of the individual woman.[1]

We all know and recognize the fact that the extirpation of these organs during the period of their functional activity gives rise to marked disturbances in the individual, which persist many months and sometimes to the end of the life of the woman.

The principle governing us should be to aid nature in curing diseased tubes, ovaries, uteri, and not to quickly rid ourselves of this responsibility by hastening to extirpate them. The true attitude of the surgeon should be only to extirpate those organs that have become so hopelessly diseased that their removal will cure ills greater than the ills induced by their absence from the economy. That in proper cases the extirpation of pus-tubes, neoplastic and suppurating ovaries, neoplastic and suppurating uteri, are life-saving operations, none will deny; but that in inflammatory diseases of these organs all of them should be sacrificed because one or two of them are diseased, is unscientific, unsurgical, and morally wrong.

To illustrate, the following case is cited: In April, 1895, Miss A., aged twenty years, was referred to the writer for the cure of

[1] We have recently learned much regarding the offices of the thyroid and pituitary glands. A few years ago they were physiological puzzles. Today we know they perform important functions in the economy of man. The functions of the uterus after the menopause are not well understood. That it bears some relation to the co-ordination of nervous energy there seems little doubt. Some minor offices are apparent, viz.: It aids in maintaining the sexual relations of husband and wife. It preserves the anatomical relations of the bladder and rectum, and furnishes secretions that render comfortable the vagina and external organs of generation. What the future will reveal regarding the functions of this organ we cannot now conjecture, but that they will be determined and that they will conform to the physiological laws above stated we are fully convinced.

pelvic inflammation. The uterus was large, livid, and soft. The cervix presented a large erosion which bled freely upon touch. There was a profuse muco-purulent discharge from the uterus. There was in irregularly shaped, boggy mass low in the left side of the pelvis. There was also an indurated and thickened condition of the tissues upon the left side of the pelvis. An examination of the cervical secretion discovered abundant gonococci. The patient was quite ill, being barely able to walk around the room. The illness was of about two months' duration, and one which, according to the teaching of Jacobs, Richelot, and others, would be best treated by total ablation of the uterus, tubes, and ovaries. The writer, guided by his successful experience in a considerable number of similar cases, decided upon a different course. The uterus was curetted and subsequently treated for ten days, when an abdominal section was performed and a tubo-ovarian abscess was extirpated. The remaining tube and ovary were liberated from adhesions, brought to the surface, examined, and, not being found markedly diseased, were dropped back. The pelvic cavity was flushed with sterilized hot water and subsequently drained for two days. The patient made an easy and rapid recovery from the operation, and after two months' subsequent treatment regained her health and remains well to this day.

This victim of unchaste love, who from a single transgression contracted a dangerous and loathsome disease, was cured of her bodily illness and is gradally regaining her self-respect and purity of mind. She is competent to sustain wifely relations and to become a mother. What a widely different record than this would have been written had we made a clean sweep of the pelvic organs? Suppose this patient had been a young wife, the victim of her husband's early indiscretions, and total castration had been effected. I cannot bear to dwell upon the picture of the blighted wife, the agonized husband, the childless and unhappy home.

But the hysterectomist condemns all such expressions as this as "wasted sentiment." The gynecologist is a true man, a member of the great brotherhood of men. He will keep alive such sentiments.

What, in actual experience, have been the after-effects upon the woman of the removal of the uterus? In endeavoring to answer this question the writer will draw largely from his personal expe-

rienee and observation. His personal experienee as an operator in hysterectomy is limited to eighty-four cases, of which twenty-four were performed for fibroid tumors of the uterus by the abdominal method, and sixty by the vaginal method. Of the latter six were for inflammatory diseases, one for proeidentia, and fifty-three for caneer. The eancer eases were, all but a few, done early.

But the writer's observation has not been eonfined to his personal experience, inasmueh as his conneetion with three publie clinies has afforded him opportunity to eome in eontaet with quite a number of patients who have been operated upon by this method by other operators. In very briefly summarizing his experience he will say, elderly women bear the removal of the uterus mueh better than young women, or even than middle-aged women who have not passed the menopause. The majority of women who have had their uteri removed for gross disease of the organ beeome gradually restored to health. Yet in many cases there is more or less disturbanee of the nervous system and of the emotional nature. In one instanee only has the writer seen mental alienation follow total eastration, and in this instance there were evidenees of aberration of the mind before the operation, whieh was one for the removal of uterine fibroma.

The late disturbanees, it seems to the writer, of the nervous system and emotional nature in young women are greater than when the appendages alone are removed. These disturbanees are, however, not so great as to eontraindieate an operation whieh is life-saving or whieh reseues a woman from hopeless invalidism. In young married women the results of the operation upon the sexual relations are frequently so marked that, exeept to save life, the writer would hesitate long before resorting to the operation. Every means that promised a eure would be resorted to first.

Fortunately, in suppurating eases of pelvie inflammation salpingo-oöphreetomy is quite as effieient in (as nearly as I ean estimate it) 97 per eent. of eases. If our estimate is very nearly a correet one, it will be time enough to extirpate the uterus if our efforts fail to relieve the organ of its septic condition.

Dudley[1] has ealled attention to the distribution of the pelvie peritoneum and its offiee in aiding in respiration and in prevent-

[1] Transactions of the American Gynecological Society, vol. xix. p. 58.

ing intra-abdominal pressure and tension. These functions are certainly lost when it is replaced in the pelvis by scar-tissue.

Another result of the extirpation of the uterus is the disturbed anatomical relations of the bladder, rectum, and sigmoid. I was deeply impressed by the changed relations of those organs by witnessing a post-mortem upon the remains of a woman who died a year after a total castration. The patient died of some obscure disease. Upon examination of the pelvic cavity it was found necessary, in order to reach the pelvic diaphragm, to tear loose and lift up densely adherent small intestines. It was found that the posterior surface of the bladder was adherent to the lower portion of the sigmoid and upper portion of the rectum. On liberating the bladder and pulling it forward we found a dense, firm diaphragm of cicatricial tissue stretching across the pelvis from side to side, partially occupying the space formerly occupied by the broad ligament, uterus, and cul-de-sac. This was a case of supravaginal hysterectomy and afforded an explanation of the complaints so frequently made to me by patients who had undergone hysterectomy, and who complained of suffering sharp pain through the pelvis on coughing, sneezing, or jumping out of a buggy. The mobile, elastic tissue had been replaced by sensitive scar-tissue, so that the impact of the pressure suddenly brought to bear upon these tissues from above produced pain.

After vaginal hysterectomy the bladder frequently falls down against the sigmoid flexure of the colon or upper portion of the rectum and adheres there, so that it is not uncommon to hear patients complain of an uncomfortable feeling in the bladder when the bowels act.

I do not regard the displaced bladder as a very grave objection to hysterectomy, yet it must have some weight in making a decision.

Another drawback (and it is a strong one) to vaginal hysterectomy is the necrosis of tissue and suppuration that always follow for several days when the clamp method is employed. We have always found it necessary to isolate these patients because of this necrosis and suppuration. We have seen a whole ward affected because of this neglect to so isolate the patients. That systemic effects usually attend this process is evidenced by the rise of temperature and accelerated pulse that is present during its height.

In a few instances the writer has seen recovery much delayed in consequence of this pathological condition.

We have now recorded a few of the chief objections to the routine practice of hysterectomy in pelvic inflammation. In view of them the writer can see the method one of choice only in exceptional cases. Salpingo-oöphrectomy cannot be displaced by hysterectomy. That any method will occasionally fail to cure cannot be denied, yet our recoveries are continually increasing as one element of failure after another is being eliminated. In salpingo-oöphrectomy, if we can do away with the stump, one source of subsequent pain and soreness is removed. The writer's enlarged experience more firmly than ever convinces him that the method he proposed one year ago,[1] under the restrictions then stated, will enable us safely to avoid ligating the pedicle by the *en masse* method. The latter method should, in his opinion, be reserved for selected cases—viz., those cases of great vascularity of the pelvic tissues and cases of retroversion and prolapsus of the uterus.

Noble's paper at the Atlanta meeting of the American Medical Association was timely.[2] He strongly advocates opening and draining large acute pelvic abscesses through the vagina. This method is not new, but had in some quarters fallen into disuse. Its employment will frequently obviate the necessity of more radical means.

Henrotin carries the method of incision and drainage further, so as to include old cases of double pyosalpinx and abscesses of the ovary. In his enthusiasm he presents facts and arguments which tend to establish the method and also to overthrow some of his strongest arguments for total castration. He says: "Women do recover from salpingitis and pyosalpinx, from ovaritis and ovarian abscess, from cellulitis and from phlegmon of the broad ligament, whether they be of the catarrhal, puerperal, or gonorrheal type, and they sometimes recover entirely and completely, so that this contingency, even if infrequent, must always be considered in forming surgical conclusions."[3]

In extending the use of the vaginal incision and drainage he does not find it necessary to ablate the uterus, even though the Fallopian

[1] Journal of the American Medical Association.
[2] Journal of the American Medical Association, Aug. 8, 1896, p. 301.
[3] The American Journal of Obstetrics, July, 1895, pp. 769-783.

tubes and ovaries do become obsolete. The fact is, in such cases as are mentioned above, it is exceptional for the uterus to be so far diseased as not to be amenable to curative treatment.

In the summer and autumn of last year the writer did total vaginal castration in five cases in which there were gross lesions of the uterine adnexa. Four of them were suppurative cases. They were cases of chronic recurrent inflammation. In four of them an examination of the uterus after its removal revealed little abnormal in that organ beyond a glandular endometritis. In one case, in which the disease was dependent upon a mild sepsis following an abortion, the uterus was large, flabby, and succulent. The endometrium was greatly hypertrophied and there was present a muco-purulent discharge. The patient made a slow but complete recovery, and the writer was entirely satisfied with the method pursued. The other four patients all recovered, and three of them were cured, while one of them is still suffering the nervousness incident to the artificial induction of the menopause. Her emotional nature is disturbed and she cannot endure sexual intercourse. She has improved slightly during the last two months, and we hope to see her eventually recover. In this patient the uterus was retroverted, bound down by adhesions, and prolapsed to the second degree. There was also gross lesion of the adnexa. An abdominal section and bilateral extirpation would have been the preferable method, for by this means we could have overcome the displacement of the uterus and have retained the organ.

We wish, in conclusion, to answer one objection urged against bilateral extirpation of the adnexa. It is that a weakening or destruction of the integrity of the broad ligaments results, permitting displacements of the remaining uterus.

Such has not been the writer's experience. When the uterus is retroverted, bilateral extirpation effectively overcomes that displacement almost universally. It is not necessary to do a ventrofixation. When the pedicles are tied by the *en masse* method the broad ligaments are drawn taut and the uterus lifted up with the fundus pointing slightly forward. The writer has observed this fact and demonstrated it over and over again. It is one of the well-known benefits of double salpingo-oöphorectomy.

My conclusions may be stated as follows:

1. We recognize the utility of hysterectomy in a small percent-

age of cases of bilateral suppuration of the tubes and ovaries in which the uterus is distinctly septic, and in cases of septic uteri which cannot be cured by other means after the bilateral salpingo-oöphorectomy.

2. We oppose hysterectomy as a rule in inflammatory diseases of the pelvic tissues, upon the following grounds, viz. :

(*a*) The uterus is the central organ of the reproductive system, and should not, except for palpable and urgent causes, be extirpated.

(*b*) It is only in rare cases that the uterus is so far diseased as to resist the curative effects of appropriate treatment.

(*c*) The removal of the uterus profoundly affects the nervous system and emotional nature of young women deprived of this organ.

(*d*) We oppose the removal of the uterus from anatomical reasons, to wit: As a result the vagina is shortened, the anatomical relations of the bladder, sigmoid, and rectum are changed, the elasticity of the pelvic diaphragm is greatly diminished or entirely removed, the elastic tissue being largely replaced by sensitive scar-tissue.

(*e*) In married women it often disturbs the sexual relations of husband and wife, and is apt to induce mental depression.

(*f*) Vaginal hysterectomy compels the use of drainage because of the necrosis of tissue and suppuration induced.

SHALL WE LEAVE THE UTERUS IN SITU IN EXCISION OF THE ADNEXA.

By E. F. FISH, M.D.,
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THE care and treatment of the female pelvic organs have received more attention during the past twenty years than any other branch of surgery. I say the past twenty years, for abdominal surgery was quite limited previous to that period. With the developments of the last decade the practice of asepticism has made it possible for many surgeons to attack the uterus and to enter the abdomen with impunity. As a sequence the female reproductive organs have bravely faced the curette, have given up ovaries and tubes, have submitted to total ablation, and are now receiving some little protection by the conservative element of the profession. With the improvement of the technique in abdominal and vaginal hysterectomy we *all* have kept our eyes on that organ, and invented an array of arguments in favor of operations that would tax the ingenuity of a Simpson or a Peaslee to answer. It is in view of this that I have deemed it proper to present this paper in defence of the uterus.

When I first went West to practise in Montana we used to refer to the pioneer as one who had killed his man; such distinction made him a good citizen. Nowadays the gynecologist who has not removed, both by vaginal and abdominal section, a list of uteri cannot hope to receive recognition. But the time is at hand when we should at least curtail this practice. The man who can successfully repair a badly lacerated cervix or perineum is of far more value to humanity than one who sleeps on his guns, at all times ready for a uterotomy or an exploratory abdominal section.

He who argues that with the tubes and ovaries removed the uterus has no function and should also be excised is theoretically

eorreet. I say theoretically, because praetieally I think he is wrong. For a long time I was an ardent advocate of the theoretical, basing my arguments on the grounds that taking the uterus along with the adnexa preeluded carcinoma, malignant disease, and prolapse, and avoided the neeessity of atrophie change. While all this is true, the chances of destructive disease engrafting itself on the non-pathologie uterus are *nil*, and I cannot eonceive of any valid argument for removing a normal uterus beeause its tributaries are effaced. I fancy I hear some one say, "The uterus is pathologie in nearly all these eases." This, I admit, is in a measure true, and if it is diseased to such an extent that grave doubts arise as to its yielding to treatment, then I am deeidedly in favor of taking it along with the ovaries and oviduets. On the other hand, when the pathologie condition is such that the mieroscope is required to demonstrate it, and when a little loeal treatment will suceessfully aid it to resume its normal state, I am in favor of leaving it. The uterus is not alone a cradle for the growing fetus, but is, in addition, a part of a woman's make-up, and, being of erectile tissue, is as well an organ of eopulation as of reproduetion.

I do not believe that a woman ever became insane from the mere loss of any or all the organs of reproduction. It is not the loss, but the knowledge of the loss, whieh may lead to mental depression and insanity. This is plainly exemplified in our every-day worldly transaetions. Men become insane brooding over the loss of position, fortune, their wives and families. The concentration of the mind on that one gloomy subject leads to an unbalaneed condition. Therefore I repeat that women from whom all the reproduetive organs have been exeised, realizing their eondition and brooding over the strained family relations whieh are likely to result, sometimes terminate their existence or beeome subjects for the asylum. The world is full of surgeons and gyneeologists. The aim of the surgeon is to do all kinds of surgery (and it may be said to their credit that they generally live up to the rule never to mutilate or remove more than is absolutely neeessary), and both surgeon and gyneeologist, in their early struggles for reeognition, strive for an opportunity to do a hystereetomy. This leads to some very "bold work." Would that the ethics of the profession permitted me to illustrate my definition of "bold work!" It is often a simple matter to destroy the pelvic organs; it is impossible to replaee

them. I am not trying to argue in favor of leaving a degenerated uterus. On the contrary, I am in doubt as to the advisability of excision of the adnexa for hystero-fibromyomata. This procedure, in my judgment, is only applicable for the small interstitial fibroma, which causes hemorrhage and does not produce symptoms of pressure. The ligation of the uterine arteries as advised by Martin, and ovarian arteries and utero-ovarian anastomosis as advised by Robinson, certainly have their places. I believe that both operations have prolonged many lives and restored otherwise hopeless cases to comparative health. Women almost completely exhausted by long-continued hemorrhage due to the presence of these tumors, and unable to withstand the shock of a more radical operation, have been miraculously restored to apparent health, and, judging from reports, absolutely cured by both methods. I do not consider either method suitable for large tumors, fibromata, or cysto-fibromata, because of the danger of venous stasis, necrosis, or embolism, nor is Martin's operation suitable where the uterus is drawn high in the pelvis.

Myomectomy is a procedure which I consider of great value for certain of these benign neoplasms. When too much of the uterus is not involved it should be done. While it is most applicable to the subperitoneal variety, it is not inapplicable to the interstitial, even if we have to enter the triangle of the uterus. Personally I am not in favor of castration, as first recommended and done by Trenholm, Hegar, and Tait, and still recommended by Hegar for nearly all forms of fibromata; nor of Martin's nor of Robinson's operation, except under extreme conditions; nor of any other operation which aims to leave the growth within the pelvis. On the contrary, I believe that whenever the case is not inoperable we should resort to myomectomy or hysterectomy, because castration frequently does not induce the desired result—menstrual cessation and consequent atrophy—because of the possibility of necrosis or embolism, and because of the tendency to malignant degeneration. I am also in favor of early operation while the neoplasm is still benign. If we wait until rapid growth begins we have waited too long, for I believe that already destructive change has taken place. The tendency to recur satisfies me that delay is often fatal, for when these neoplasms do recur they come in the form of spindle-celled sarcoma.

In cases of pyosalpinx we are often enabled to save the uterus by abdominal section. We can thus obtain a clear view of the condition and avoid a hysterectomy when the pus is confined outside of the uterus. When, however, there is a suppurative condition of the uterus in addition, total ablation is undoubtedly the only safe procedure. By the vaginal method it is, in most cases, necessary to sacrifice the uterus or leave everything and drain. This latter may be good practice when the pus-sacs are not too high, for, if it fails to cure, the more radical operation can be done later with less danger of sepsis. I cannot agree with Schauta and Tait when they claim that the uterus must be sacrificed with the appendages in all cases of gonorrheal pyosalpinx. I am aware of the existing pathologic condition in these cases, but I believe I have had good results by thorough curettement and cauterization, together with the excision of the tubes and ovaries. This same statement obtains in cases of pyosalpinx of puerperal origin. Under such circumstances the suppuration is the secondary consequence of puerperal infection; if we can diagnosticate the condition when limited to the uterus, such conditions as thrombo-phlebitis, necrosis, mural abscesses, etc., hysterectomy may be justifiable. The difficulty lies in the diagnosis. When once the infection has passed beyond the uterus and entered the general circulation, lymphatics, and cellular tissue and become constitutional, our only hope lies in drainage. A hysterectomy, under such circumstances, followed by recovery, is no evidence that the operation is justifiable, any more than the same procedure would be for putrid intoxication due to the presence of a septic tampon. Serum-therapy is still *sub judice*. I have never had any experience with it, but am favorably impressed with some of the reports I have seen.

In the tubercular affections of the uterus and appendages I can offer no plea for protection.

Prolapsus uteri, so long treated by plastic operations on the vagina, as first advised by Emmet, conjoined with repair of the tears of the perineum, amputation of the hyperplastic, lacerated, and ectropic cervix uteri, is now quite successfully relieved by the addition of hysterorrhaphy. When, however, the prolapse is complete, drawing down the bladder and rectum and over-stretching the connective tissue and serous supports, and especially when the question of future pregnancies is no longer a consideration, Baldy's

method of supravaginal amputation and suturing the stumps of the broad ligament to the cervix, thus suspending the cervix and vagina, seems to me to be a most valuable addition to our surgical resources.

The consideration of malignant disease hardly comes within the scope of this paper. While high amputation of the cervix for carcinoma may leave a healthy body and fundus, the operation is as difficult as complete hysterectomy. Cancerous nodules are often found in other parts of the uterus which are entirely independent of the cervix, and by resorting to high amputation in such cases we have not improved the condition of our patient. The possibility of the existence of such nodules is to me sufficient warning to eschew the operation.

When, finally, we decide that the uterus must be sacrificed, various procedures are urged. Péan, Jacobs, Richelot, Segond, *et alia*, favor the removal of the entire uterus via vagina when it becomes necessary to excise the appendages. Others, such as Krug and Baldy, favor abdominal section and supravaginal amputation at the internal os, while others again of the Polk school advocate complete ablation by abdominal section. I believe that the entire organ should be taken, unless the cervix is sound. I am not an advocate of the supravaginal amputation where the cervix is pathologic, for by so doing we leave the most vulnerable part of the organ. To leave an unsound cervix uteri is doubtful practice, for it is the favorite point of attack for malignant disease. Statistics show that about one-third of the cancerous affections occurring in women are in the uterus, and of these a very large percentage occur in the cervix.

My conclusions are:

1. That whenever it becomes necessary to excise the uterine adnexa, if the uterus is sound, leave it.

2. Whenever we excise the tubes and ovaries, and the uterus, though in a pathologic condition, in our judgment will yield to treatment, leave it.

3. Whenever it is necessary to do an abdominal hystero-salpingo-oöphorectomy, and the cervix is healthy, do a supravaginal amputation, as this leaves the vaginal vault intact.

4. Whenever it is necessary to do a supravaginal amputation

suspend the cervix to the stumps of the broad ligaments, or anchor it to the abdominal wall, to prevent polapsus vaginæ.

5. Whenever it is necessary to do a general ablation and the cervix uteri is unsound, take the entire organ, because of the danger of carcinoma.

6. Whenever a subserous or interstitial myoma can be removed without too great danger to the uterus, do a myomectomy and leave the organ.

7. Whenever we excise the appendages and leave the uterus ventral fixation is not an unsurgical operative conclusion.

My reasons for leaving the uterus are:

1. It helps to maintain the woman's sexual integrity.

2. It relieves the patient of much mental strain, and is a prophylaxis to neurasthenia, melancholia, and insanity.

3. It tends to maintain the family ties unstrained.

4. It obviates the possibility of vaginal hernia, cystocele, and proctocele if the perineum is normal, and delays vaginal atrophy; and, last of all, it holds up and prevents shortening of the vagina.

DISCUSSION ON THE PAPERS OF Drs. DAVIS, DUNNING, AND FISH.

Dr. L. S. McMurtry, of Louisville.—Mr. President: The subject which the papers of Drs. Davis, Dunning, and Fish have dealt with is one the importance of which cannot be overrated. I have strong convictions on the subject, and, at the same time, there are men whose judgment and surgical ability we cannot question from whom I differ as to methods of procedure. The difference is very great and vital, and it becomes necessary for us to take the whole situation carefully in mind and discuss it fairly, thoroughly, and impartially. As I understand it, the question, briefly stated, that presents itself to us is this—namely, whether the best method of treating inflammatory diseases of the pelvic organs can be obtained by a suprapubic abdominal section or by the vaginal route.

In the first place, the surgical approach to the pelvic organs by the vagina is not new. You all remember that Battey's operations at first were done through the vault of the vagina. These operations were what he called normal ovariotomies, and all these years that pelvic

surgery has been practised so successfully pelvic surgeons have recognized, in certain cases in which an immediate life-saving procedure was necessary and a radical operation could not be borne, that vaginal incision and drainage was a valuable surgical procedure; hence there is nothing really new, *per se*, about the question of vaginal operations. The only question that is new in that relation is as to the removal of the uterus. The operations that have been done for suppurative pelvic disease by abdominal section have been difficult and trying. Everyone engaged in this work has recognized that the surgical treatment of suppurative inflammatory disease of the adnexæ is among the most difficult of all surgical operations. Any method that will simplify or improve the procedure, rendering it easier of accomplishment and more satisfactory in its results, will be welcome.

It is interesting here to notice the origin of the operation and the manner in which it has presented itself to us in this country. French surgery was for a long time ascendant in the world, particularly in the days of Velpeau, Nélaton, and other men who were leaders in surgery. Abdominal section never flourished in France, and Parisians are not successful operators above the pubes. They have always, in their gynecic surgery, been working in the cervix and through the vagina, and while we were doing in this country and in England abdominal section for suppurative pelvic disease, it was not a success in France. Péan, Segond, Richelot, Doyen, and Pozzi have come to the front and have advocated this method of extirpation of the uterus in order to drain the pelvis and cure suppurative pelvic disease. The method extended to Brussels, which is closely allied to Paris, where the same language is spoken, and the profession is as largely controlled in its surgical opinion by Paris as though it was only across the Seine. Dr. Jacobs, of Brussels, an expert operator, became a convert to the idea of Segond, Péan, and Richelot, and began to do this operation. Dr. Henrotin, of Chicago, who is a native of Belgium, became an exponent of the operation in this country. Dr. Jacobs was introduced in this country by Dr. Henrotin. His visit was followed a year later by that of Segond.

The introduction of this method was cordially received, as might have been expected, by that class of surgeons in America who are always looking out for novelties in surgical operations and are extreme exponents of the restless spirit of surgery. And it is being made to appear that men who resort to abdominal section for inflammatory disease of the pelvic organs, who remove diseased structures and nothing else, are behind the times. This recital of recent history has a bearing upon the discussion of this subject which cannot be ignored. The personal

equation in these operations is what determines the choice of methods. You know we have had in America all these years men who never operated much suprapubically, but were always ready to operate on the cervix, to curette the uterus, and work in that direction. The introduction of this operation furnished to that particular school of American surgeons a field most welcome and attractive. They extirpated the uterus. If a man has been accustomed to operate through the vagina, his entire surgical training has prepared him for vaginal hysterectomy. If he has learned to operate successfully suprapubically, I do not think he will ever abandon it to take up the other operative procedure. In my judgment a surgical operation should be based upon and directed along those lines which will secure the recovery of the patient with the least sacrifice of organs possible, with the greatest safety possible, and that will restore permanently the health of the patient. These I would make the basis of an operative procedure. We never have had the results of vaginal operations for pelvic suppurative disease recorded in this country. When we get that history I believe the number of injuries to the bowel and bladder that have occurred will be astonishing. If you operate suprapubically and injure the bowel and the bladder, and do not repair them, the subsequent danger to the patient's life is very great. In operating by the vagina all kinds of surgical sins can be committed, and the patient's life may not be paid as a penalty. That appeals strongly to many operators.

An objection made to the suprapubic method is that it leaves a scar. I appeal to the Fellows here who have operated by the abdominal method, and ask if they have ever yet heard a single woman make any complaint of the scar? Personally, I cannot recall a single instance. Again, immunity from hernia following vaginal operations is given as an argument in its favor. I think when we come to know the facts regarding vaginal operations we will find that a great many more hernias occur as a result of this method, together with prolapse of the vagina, than by the abdominal route.

The next objection to the abdominal operation is that by leaving the uterus, it is a focus of infection and the patient is not well on account of it; and another argument in favor of removing the uterus, after the tubes and ovaries have been taken out, is that it is no longer of any use. I do not think either one of these arguments will be found tenable.

I believe the number of operations done by the vagina for pelvic suppurative disease is diminishing. Many operators have started with the vaginal method, and before completing the operation have resorted

to the suprapubic method, showing conclusively by their own technique that we have a more advantageous field of manipulation from above. Furthermore, advocates of the vaginal method decry drainage. They say it is absolutely not needed, and should be abandoned; that it is a disadvantage in that it produces hernia and makes holes in the intestines. They then claim that better drainage is afforded by the vaginal route. There is very little logic in such arguments. There are some principles in surgery that it is doubtful if they will ever be improved upon; as, for instance, Ambrose Paré's discovery of the ligature. We may change the material, but the method of tying an artery and of rupturing the coats so as to secure permanent closure is something that will probably remain in surgery forever. When we come to remove disintegrating and sloughing tissues, we should take them away thoroughly and completely, separating all adhesions and restoring normal relations. In these cases we apply a great principle of surgery which is as everlasting as the tying of an artery.

There is a field for vaginal hysterectomy in certain puerperal cases. There are cases of puerperal sepsis in which the uterus is riddled with small abscesses, where that organ is undergoing sloughing, and where the patient is reduced to such a degree that she should not be subjected to a very extensive operation. In such cases I can readily see that to quickly clamp everything to save time, to remove the uterus, and establish drainage in that way would be a procedure that has a field of application which is legitimate and valuable. But we have seen during the past two or three years hysterectomy done as a routine procedure. In my opinion it is bad surgery, and I do not think it will last.

In regard to the other method of procedure, I do not see any reason to make a change. Nothing is more satisfactory in a case of suppurative salpingitis than to open the abdomen, turn out the masses, tie them off closely, separate all adhesions, clean out all dirt, insert a drainage-tube, and put the patient to bed. No recovery is more prompt, no procedure more rational, and no result more permanent and satisfactory.

Dr. John M. Duff, of Pittsburg.—I was one of the last in my section to begin vaginal hysterectomy. I commenced to do it, perhaps, a little against my own judgment, because everybody else was resorting to the operation, and it became a fad. I operated on quite a number of cases by this method, and my patients did well; in fact, they did so well that for some time I did not resort to any other method until the meeting of the American Medical Association at Atlanta. After listening to papers and discussions there I went home with my mind made up to do both operations—that is, I would put the patients

in bed side by side and endeavor to ascertain the results. My operations since that time have not been great enough in number to draw such conclusions as I would like before expressing an opinion.

There is one important factor in connection with this subject which I have not been able to definitely decide for myself, nor has anyone else satisfied me fully—namely, with regard to the propriety of allowing the uterus to remain after removal of the appendages. There are some good reasons why perhaps it should remain. On the other hand, if allowed to remain it is a focus for sepsis, and as far as the condition of the woman is concerned the results as attested to me by my patients are that they feel as well as do those who have had their uteri left *in situ*. I have been fully satisfied with one question that was brought up at the Atlanta meeting, which is that patients enjoy sexual intercourse fully as well, and two patients upon whom I have operated since that time who did not have much sexual appetite prior to operation have noticed an increase of the sexual passion since then. One factor of which Dr. McMurtry speaks as in favor of the suprapubic operation is that the surgeon can always see what he is doing, and there is perhaps much less danger of injuring the intestine; but, on the other hand, there is not as much shock to the patient attending the vaginal operation. As a rule, when I operate by the vaginal method my patients rally sooner than they do after the suprapubic operation. They are able to be out of bed sooner than those upon whom I do a suprapubic operation.

I asked one of the internes of the hospital in Pittsburg to send me the temperature-records of some cases upon which I had operated, and through a mistake they got mixed, hence I have only three of them in my pocket, and they happen to be the temperature-records of the vaginal hysterectomy cases. I am sorry I have not obtained the supravaginal temperature-records to compare with them. I will pass these three around. In one case the temperature rose 1° or 2°; in the others there was comparatively no rise of temperature at all. The patients felt good and wanted to sit up in bed two or three days after operation.

Dr. Stone.—Was there a rise of temperature in any of your cases before the operation?

Dr. Duff.—Yes. Two of them had considerable temperature; the other did not. One patient had a temperature of 104° when operated upon. On the second day after operation it came down to normal and remained so. We ought to be fair. I am trying to come to just conclusions in regard to the relative merits of the two operations. I remember a case two years ago that was brought into the hospital

upon which I was afraid to operate, the patient having a temperature of 105.5° when placed on the operating table. I did a suprapubic operation, and within two or three days the temperature came down, and never went up thereafter, the woman making an excellent recovery. Dr. McMurtry has intimated that it does not require as much skill to go in through the vagina as it does to do suprapubic work. It seems to me the factor in deciding the particular method to be pursued is a man's ability. Naturally he will resort to that method by which he can do the best work, and I believe I am among the number that do their best work through the vagina.

THE PRESIDENT.—I agree with Dr. McMurtry in regard to the importance of the three papers that have been read, and we cannot devote our time more profitably than to a discussion of the relative merits of the vaginal and abdominal operations. At the meetings of the American Medical Association, where so many different views are presented and where the general practitioner goes to get light, he is really confused. Dr. Davis is right in his position, but it is a difficult matter indeed for him to give you his precise position. For instance, he told you that in the desperate, dying class of patients—those that were almost helpless, with pelves full of pus—we should resort to incision and drainage. While this method may afford temporary relief, a more radical operation will be called for later on. A great many cases where the vagina is incised and drained are placed on record as cures. If you incise a right iliac abscess and a left pus-tube, leaving the right ovarian abscess and right pus-tube, you leave half of the pus behind. You have only half-drained. There will be an old, necrotic sac in the deep pelvis, and you should not leave it. You stick gauze in there and call it a cure. It is not a cure. In from one to fifteen years later the woman has a sinus or sinuses in the sacrum or groin, and then it is a hopeless case. Some of these patients are subsequently treated for sepsis or typhoid fever.

Twenty years ago, in one of the Philadelphia hospitals, the vagina of a woman was incised and drainage established, followed later by a suprapubic section, with the drain pulled through and tied around the pubic arch. One patient's vagina was incised several times by different Philadelphia surgeons; she went to Pottsville, and fifteen years after the incision there were seven sinuses about her sacrum and groin; through a fresh incision I evacuated a gallon of pus and established complete drainage. We must not lose sight of the history of pelvic abscesses by the old treatment of vaginal incision and drainage, and this is only a revival of it that we have had in most of our meetings. We have held fast to most good things in surgery, and if our

forefathers had found the puncture and stab methods good, we would not have rejected them. I am sorry that Kelly reports thirty-seven cases of vaginal incision and drainage with one death; and just here I wish to touch upon a vital point: hospital surgeons at the present time are afraid of their colleagues and are also afraid of their board of directors. Their colleagues and the board of directors are now familiar with the methods of operating and the mortality following them. You will find surgeons throughout the country dismissing a class of cases that some of us have to care for. I have passed through one city in this country eight times to do operations rejected there as inoperable or hopeless. I lost three cases out of the eight. A surgeon recently said to his assistant: "We will have to be careful; we have had too many deaths, and the managers are complaining." He closed the incision, turned the patient over, and punched a little hole in her vagina for drainage. If a surgeon is afraid to open the abdomen for the purpose of enucleating huge pus-tubes and ovarian abscesses and repairing lesions of the sigmoid, freeing sixteen inches of ileum and repairing it, if necessary, he should adopt the vaginal route, or send all such cases to a man with thirty-three vertebræ.

I look upon vaginal surgery as absolute play. Extirpation of the uterus by the vaginal method is one of the easiest operations in surgery. Enucleation of pus-tubes and ovarian abscesses in cases of long standing is not so easy; they are not enucleated by the vaginal method. We must consider work done by the vaginal route as incomplete. Here I will refer briefly to Jacobs's cases. In seventy-two cases he did two abdominal sections, in one of which he used the Murphy button, doing good surgery, and saving his patient. In the other he removed the kidney for ureteral fistula. Secondary operations have been quite numerous of late as the result of incomplete vaginal work. The vaginal operation is not sufficiently old to give us a group of cases that will turn up in the hands of others for completion. I must insist that vaginal operations are imperfect.

Someone has alluded to pelvic abscesss. I have done nearly 4000 sections, and I have not seen pelvic abscess independent of tubal and ovarian disease, except it was traumatic. A crochet-needle inserted through the vaginal vault may cause a broad-ligament abscess. We may have abscess in the cellular tissue due to traumatism, but I have never found one due to inflammatory mischief.

Reference was made to Dr. Noble's cases as errors in diagnosis. Three or four of them were cases of appendicitis, and two or three were pus cases with secondary operations for removal of the pus-tubes, and one a suppurating extra-uterine pregnancy with the fetal bones

sticking through the vaginal vault. Dr. Noble's cases were (nine) errors in diagnosis. Vaginal incision and drainage is an old operation; there is nothing new about it. Extirpation of the uterus, as practised, is a simple procedure, and in America I do not think our results are any worse than they are abroad. I condemn the vaginal route, not because my mortality influences me in the least, for I have a series of vaginal hysterectomies of fifty-three cases with one death, and in this series I removed everything. It is a safe operation, but an incomplete one. The surgeon remains in perfect darkness as to what exists above.

Dr. McMurtry has alluded to appendicitis complicating tubal and ovarian disease. In every hundred abdominal sections for suppurating tubes and ovaries, we remove the appendix in 6 per cent. of the cases. I removed it day before yesterday in a case, and also twice last week. I removed it along with the suppurating tubes and ovaries. For instance, in the last twelve days I have stitched the bowels seven times in suppurative forms of disease. Can you imagine anyone adopting the vaginal route with such a mental picture before him? Only ten days ago I operated on a case where, if I had selected the vaginal route, I should have overlooked two lesions. A few days ago a physician in operating on a case of appendicitis found an adherent infected omentum, which was not removed. He lost his patient, and then regretted that the infected portion of omentum had not been removed. Abscesses, etc., are commonly overlooked where the vaginal route is resorted to. Four days ago, while examining a patient, I recognized a twisted pedicle. The common history of twisted pedicle is pain, rapid increase in the size of the tumor; and I said to the doctor by the side of me, "We have a twisted pedicle to deal with." I opened the abdomen, found an ovarian cyst in the bottom of the pelvis, found the omentum adherent to the tumor, and after reconnoitring I thought we had the left kidney or spleen, but, after freeing the omentum, it turned out to be a tumor as large as a child's head growing from the small bowel. I did a resection of the bowel, then removed the ovarian cyst. Suppose I had done the vaginal operation, I should have removed the small tumor and permitted the malignant tumor of the bowel to remain.

"Septic uterus, rotten uterus"—these are peculiar terms. If there is a single woman in this city with a "septic" or "rotten" uterus, she will be in glory in a few hours. Sepsis is the same the world over. It kills quickly. "An infected, rotten uterus." You commonly hear men using these expressions while criticising some one else's work. It is very curious, but a few years ago the same class of men would remove a tube and ovary, and the woman afterward would bear children. Now they say the uterus is "septic," and it must come out.

A few years since operators recorded a series of fifty and one hundred cases with the most happy results. But now the results are all bad. The man who does a complete operation may perhaps have an additional mortality of 3 to 5 per cent.

As to insanity, we have not in this country now what may be termed a surgical asylum for the insane. It is folly for us to talk about this matter with a lot of politicians who are at the head of our institutions. The man who will open a private asylum of this character will do the best work that can be done for the women of our country.

I have repeatedly found mesenteric abscesses and growths above the pelvis in my surgical work, independent of pelvic disease coexisting. In pelvic surgery the removal of pus-tubes and ovarian abscesses is the simple part of the work. The leaving of a healthy and normal condition above, after removing the pathological conditions and lesions present, is really the important part of our work, and it is absolutely impossible to do complete surgery by the lower route.

Dr. J. Henry Carstens, of Detroit.—Dr. Dunning reported a number of cases that he had operated on, among which were three cases where the uterus was diseased, and which he thinks he will have to remove after having performed pus-tube operations. I am somewhat in the same position. I have operated ten times to remove the uterus where either myself or somebody else had previously operated for diseased tubes. The uterus was diseased. There was a degenerated condition of the mucous membrane. The hemorrhage and nervous symptoms continued, and two of them were the wives of physicians. Formerly some physicians did not believe in the removal of a pus-tube, but now they say that if the uterus is diseased also you had better remove it at the primary operation, if you think it can be done all at once. So, gradually, we have been drifting around from one side to the other.

Dr. Dunning says that some of us have been bitterly attacked. I think no one has been more bitterly attacked than Dr. Price, and each one of us knows what it is to be attacked. Dr. Price may be considered as a pioneer in this kind of work. No one has a right to condemn the vaginal method of operating, and say that it is incomplete. He cannot say it is incomplete, and that the ultimate results cannot be good until he has tried it. All innovators have been abused or ridiculed and hounded in every possible manner. Such men as Hegar, Tait, and Battey have been vilified in every possible way. We have all been called reckless, and considered as men without conscience. Péan, Segond, and others have been subjected to the same abuse. This is not fair. These men are not all liars, and if they posi-

tively assert that they have had so and so many hundred cases which were successful their assertions should count for something and their suggestions should be tried. After a fair trial every method will find its level.

I believe that vaginal hysterectomy for pus-tubes will show a smaller mortality and give better ultimate results than abdominal section. That is my present belief. I think cases should be selected, however. I believe in conservatism. In a young woman, I believe in abdominal section and an effort to save, if only one-half a tube and one-half of an ovary; while in women near the menopause, vaginal hysterectomy should be the rule. I wish to be distinctly understood that I am decidedly in favor of vaginal hysterectomy in certain cases, and I do not believe that all cases should be subject to abdominal section; but that one class of cases should be subject to one operation and another to the other. Nothing should be condemned upon theoretical grounds. No one has a right to assert things about which he knows nothing. First try them honestly and faithfully. The surgeon should understand the technique of both operations.

Dr. Albert Goldspohn, of Chicago.—It has been my experience that vaginal hysterectomy is an easy operation. I feel very kindly toward it; but because it is easy is not a sufficient reason for sacrificing the uterus. There is a vast difference whether a woman knows that she loses the uterus for carcinoma or for some other disease which she knows will not kill. Cancer is a terror to women, and when a woman knows that she has had a carcinomatous uterus she does not doubt that she has been blessed in its removal. But when we remove this organ for other causes, such as an inflammatory disorder for instance, the patients often dote over their imaginary loss, and what we call sentiment, with them is a mental pain that borders on mental aberration, and sometimes leads to it.

During the last winter a deep impression was made upon my mind by being terrified for several months at the prospect of two of these cases on the verge of going into an insane asylum. It took great care on the part of myself and a neurologist to keep them out.

The question regarding the abdominal or vaginal method of operating cannot be definitely settled in favor of either procedure; but as surgeons we must occupy a middle ground and use judgment. There are some cases in which the uterus should be removed, and if operated upon at all it should be attacked from below. On the other hand, if we have to deal with large pus-tubes with the intestines adherent to them, it is not easy to attack such a case from below. I have tried it, and know what it is. The total absence of sight, in such cases, the rela-

tive inaccessibility and the exceedingly strained palpation endanger the patient more from the consequent bad or imperfect surgery than does the shock from a careful but thorough and complete ventral operation.

Dr. George H. Rohé, of Sykesville.—I did not intend to take part in this discussion this afternoon, but several statements made in the papers ought not to go out without an attempt being made to call them somewhere near the middle line. In the first place, I would like to speak of the removal of the uterus from below. A good many years ago Dr. N. R. Smith invented an instrument by which lithotomy could be easily done, and some of the surgeons in Baltimore objected to it because "any —— fool could do lithotomy now." The trend of the argument in this discussion has been that almost any kind of fool can remove the uterus through the vagina. To me it is a good deal easier than to remove it from above; and that is the reason I prefer to do it in that way. I believe it is the method to pursue, and that it is just as good for the patient. In the few instances in which I have operated in this way I think it has been better for the patient than if I had operated by the abdominal route.

The statement has been made in the papers read here that women who have the uterus and appendages removed were in great danger of becoming insane; that the nervous phenomena were very much more severe than when the ovaries and tubes were alone removed. I would like to know where the facts are to be found upon which this statement is based. My own observation does not support this view.

Dr. James F. Baldwin, of Columbus.—I think the gist of the papers has been lost sight of—namely, whether in removing the appendages we shall resort to the abdominal or to the vaginal route. A discussion of this subject is threshed straw; it was considered by us a year ago at Chicago; it was discussed at the Atlanta meeting of the American Medical Association, and is, indeed, a perennial theme. The advantages of both methods have been considered. One point to be discussed is whether we shall remove the infected uterus when we take out the appendages, or whether we shall not. Dr. Dunning tells us that he has operated on 116 cases, has removed the appendages and left the uterus.

Twelve he reports as not well; three were distinct failures, and will have to be operated on later for removal of the uterus. A friend of mine has corresponded with a large number of operators throughout the world, and has accumulated several thousand cases of operations for removal of the appendages. In 5 per cent., as an average, there has been failure to effect a cure; 95 per cent. are well with their uteri.

I have no doubt that the complaints of the 5 per cent. of failures have given the operators infinitely more annoyance and anxiety than the praises of the 95 per cent. of the cured have given satisfaction.

For several years I have been in the habit, where the uterus was found distinctly diseased and enlarged, or where there was a history of long-continued trouble, of taking it out. I have never regretted it. I have never had a woman go insane or complain of loss of sexual appetite. I have found the sexual appetite just as good as before operation, and in a number of cases a good deal better; not, I mean, better than it was immediately before the operation, but better than when the parts were normal. To demonstrate the condition of the uterus in these cases I frequently take that organ, just as I have removed it, and give it a thorough curetting before the class. I then split it in two and show how little effect the curetting has had. The tension in these cases is so great that the uterus, when thus split, opens very much like a grain of popped corn. I not infrequently refer to them as cases of pop-corn uterus, and I do not believe that any amount of curetting, or carbolic acid, or iodized phenol, will restore such uteri to normal conditions. Hilton, in his work on *Rest and Pain*, an exceedingly valuable book, alludes indirectly to this class of cases when he speaks of tension as giving rise to pain, and I think that this tension is largely the cause of a good deal of the pain and other nervous symptoms that our patients complain of.

As to the vaginal route, I have made a score or more of vaginal hysterectomies. It is a very easy operation. The first one I did was done in seventeen minutes. I was astonished at its ease. But it does not seem to me surgical. When I have made an abdominal hysterectomy, removed all I think there is to be removed, brought the peritoneum nicely together, tightened up the broad ligaments so as to support the stump of the cervix, brought in the round ligaments also, so that the vagina is held up nicely, and have then closed the abdomen, I feel that I have performed a surgical achievement. When I have operated through the vagina I do not know exactly in what shape things are above. I am trusting largely to Providence. I do not feel that I have done a good surgical operation. Nevertheless, I think there is a fairly broad field for the vaginal route I think if I could go over again some of the cases I have operated on through the abdomen I should go through the vagina for the temporary purpose of improving the condition of the patient preparatory to doing a more radical operation, because I like finally to feel that the patient has been surgically well operated on.

I think the French surgeons have been carrying to an extreme the

matter of vaginal hysterectomy for inflammatory conditions. It may be that we have been doing too much through the abdomen for these same conditions, and that somewhere between lies a golden mean. I am planning now to visit Paris this fall and see these men work, and then draw my own conclusions as to the character of the work itself and the class of cases which would be best subjected to the vaginal operation.

Dr. Walter P. Manton, of Detroit.—Between three and four thousand insane people have come under my observation, and I do not recall a single instance in which the insanity could be traced to the removal of the uterus or the appendages. In my own experience I have found during the last thirteen years but two instances in which I was sorry that I did not remove the uterus at the time of the primary operation. One of these women had a septic uterus which has given a great deal of trouble since the operation. The other woman became infected subsequently by her husband, and I think all that trouble would have been obviated if I had removed the uterus. These are the only two cases that I can recall in which the uterus should have been removed.

Dr. J. Wesley Bovee, of Washington (by invitation).—I placed myself on record at the Atlanta meeting of the American Medical Association as regards the relation of the two operations, and I simply desire to say that I have not modified my opinion since. We have forgotten a few points in the consideration of this subject which have some bearing upon it. There is often infection of the ligature, which causes trouble. There are frequently injuries to the ureters, or little points possibly that have not drained well, and this gives trouble. It is not the uterus alone which gives trouble, and in some cases after you have removed the uterus nicely you will not have cured your patients entirely.

So far as drainage goes, I have not drained through the abdominal opening for a long time, but entirely through the vagina in the manner described.

The President.—Imperfect work and imperfect materials have been used as arguments against legitimate procedures. No one should criticise vaginal operations without a working knowledge of both the abdominal and vaginal methods. He ought not to, at least. An argument should never be made against any operation until it has been thoroughly tested. We know there are a number of men in America who are condemning operations, and yet are wholly ignorant of them. Jacobs and Segond are simply masters in their vaginal operations. No one can read Jacobs or hear Segond talk without recognizing at once that they are both masters and fully understand their work. But it

goes without saying that their work is incomplete. If you can dismiss everything above the uterus; if it is simply a matter of removal of tubes and ovaries, and not of correcting the overlying complications, the vaginal route is the route to pursue. If I could dismiss everything above, I would never open the abdomen again. For the removal of the uterus alone the vaginal route is important. My little girl asked to go with me one day to the city, and I said no, I am too busy. She then asked me if I was going to operate. I replied, "Yes." She is only eight years old. I said to her, "Do you understand what that means?" She replied, "Yes." "What is it?" She said, "Fixing people's insides right." As long as I have to fix people's insides right I shall do the suprapubic operation, and not neglect my duty to my patient by an incomplete procedure, or shirk my duty.

Dr. Rufus B. Hall, of Cincinnati.—It was not my intention to say anything on this subject, but one or two statements that have been made prompt me to say a few words. Like the other members of the Association, I believe there is a field for the vaginal operation. We all know what a relief it is to our patients and a gratification to ourselves in vaginal extirpation of the uterus in certain cases of cancer of this organ. After the uterus is taken out they remain well for an indefinite period, and we are much gratified at the result. In the majority of cases it is a perfectly easy operation. We go about it and do it without much trouble. Occasionally we have to separate an adherent ovary that is high up and very difficult, but we peel it out, and rid the woman of her trouble. When it comes to removal of the uterus where there is bilateral disease of the appendages, as a routine practice, as some operators claim, I do not think it is the correct method. It is known to be true that a large per cent. of cases of bilateral disease of the appendages get well after having been operated upon by the abdominal route, and remain well, in which the uterus was not removed. I should say the percentage would be somewhere about 95 per cent. It is a simpler and less mutilating operation than taking out the uterus, which must be done in the other method for this reason.

I much prefer to do a hundred operations for bilateral disease of the appendages and leave the uterus in every case, and later remove the uterus where it is indicated in the 5 or 6 per cent., if I were compelled to do one or the other. I believe in some instances that it would not be a bad idea if we could decide just when to take out the uterus with the appendages; but when I do that I do not do it by the vaginal route, as a rule. I can do it much more easily and satisfactorily to myself by the abdominal route, and then I know I have done

a complete surgical operation when I am through. When we resort to the vaginal route with the clamp, and pack the opening with gauze, we cannot see what injury we may have done to adherent coils of intestine or omentum. An adherent coil of bowel to the gauze that is left impacted must necessarily follow in some cases, and is a source of danger to the patient. There are many points I would like to speak of, but as my time is limited I will not do so. The main point with me is that I cannot repair intestinal injury through an opening where I cannot see what I am doing, as I can when operating by the abdominal route. We must necessarily injure the bowel in a given number of pus cases. Our President said that he did so twice last week; and I did it once, also twice the week before in similar cases. If I had done a vaginal operation I do not think I would have been quite so successful.

Dr. Davis (closing).—Many of the points have been covered in the discussion, and it is not necessary for me to dwell on those phases of the subject. The choice of operation will depend largely upon the operator, and it is well, perhaps, that some surgeons are extremists in one method of operating, and others in another. By such extremes we often reach the highest order of work, notwithstanding those who confine themselves to one particular method generally see nothing good in any other method. It would seem that the whole question should hinge upon the disposition of the uterus. What shall be done with it? We understand why the French surgeons resort to hysterectomy. They have operated by the vaginal route more frequently, and have become accustomed to it. The removal of the uterus is the preliminary step to all their pelvic operations. It must be removed to get at the organs. But it is hard to understand how Americans, who are removing the uterus from above, can reconcile this procedure, for it does not facilitate their work in the least. The French surgeon does it because it enables him the better to do intrapelvic operations; while the American does it—I won't say to increase his number of hysterectomies, because that would not be fair; yet it affords a splendid opportunity for one who has become tired of simply removing the tubes and ovaries to make a large list of abdominal hysterectomies. There can be no advantage in it. These very men published statistics in which they claimed to cure a large percentage of their cases by the removal of the tubes and ovaries before they adopted this method.

The men who have cut open tubes and injected bichloride of mercury into them, and claimed to have cured so many cases by the curette, are the men who are now advocating this method most enthusiastically.

What we want to accomplish first is the conservation of life, and the old practice of incising pelvic abscesses, to bridge the patient over, is a good one. We have all resorted to it. There is not a member here who would not indorse that procedure for a certain form of pelvic abscess, but where the pus is in the tubes or ovaries there is a division of opinion. It is not correct to say that in every case in which we incise a pelvic abscess we should expect to have a reaccumulation of pus; for many are cured. After these abscesses have been drained frequently a mass will be left behind. It is tubal, and if you incise it and pack gauze in the cavity you will destroy it. When we incise the tube we do it for what we would do for an abscess, and the pyogenic membrane of the tube is replaced by granulation tissue, and, finally, the tube almost disappears. My own work warrants me in continuing to incise tubes and ovaries, and I am more and more encouraged to do it on account of the good results of others. Our first duty is to conserve life, and the second is to conserve important organs. It is a beautiful thing to go in and enucleate a pus-tube, but our patients are demanding of us that we save important organs, and where a number of good men record many successful cases by the simple operation of vaginal section in connection with curettement of the uterus, we have no right to do a more formidable operation till we have given our patients the benefit of this preliminary work.

As to drainage, I think this question ought to be settled. It makes no difference whether gauze drains pus or not. If the gauze will drain serum and protect the abdomen for forty-eight hours you do not care then whether it drains or not. You gradually remove the gauze from the external opening to keep it patent, and the fluid will come away. The abdominal cavity will take care of itself after forty-eight hours. If you remove the gauze sooner than four or five days you are apt to break up adhesions and induce a worse condition than existed before the operation.

As to diminution of sexual desire, I believe that the consensus of opinion is that after a time there is less sexual desire where the tubes and ovaries have been removed, yet we have a great deal of difficulty in ascertaining from patients the facts about this matter, the sexual desire having been destroyed often by the disease for which the operation was performed.

Dr. L. S. McMurtry, of Louisville.—Before Dr. Davis sits down, I want to ask him to make clear one point, as we have so much respect for his opinion in these matters. I would like to have him explain whether or not, in the class of cases in which he has hitherto done abdominal section for suppurative pelvic disease in women, he has

changed his practice, and whether he now substitutes drainage for the operation of abdominal section; whether he is applying the principle that he has hitherto observed, or whether he has adopted a new procedure in his practice?

Dr. Davis.—In reply to Dr. McMurtry, I will say that I have practised what he and all the rest practice—namely, to incise and drain pelvic abscesses. I realize that they have their origin in the tube, and after incising such abscesses I expected afterward to do a radical operation when the patient was in a better condition. Now, I simply incise these abscesses, and examine my patients weeks afterward, and if I find a considerable mass connected with the ovary or tube, instead of doing an abdominal section I resort to vaginal incision. I do not curette the uterus at the first operation, believing that the patient should not be taxed that much. I reserve curettement for the second operation, when I incise the mass containing the tube or ovary, and pack it with gauze. After a short time the tube will be obliterated. In many of these cases a radical operation is saved.

Another point. The adhesions of which Dr. Price spoke do not remain, particularly in the acute puerperal cases. They are like appendiceal adhesions. You drain an abscess of the appendix, the appendix is drained, and you do not have to do another operation. Should you open the abdomen a few months afterward, you would find scarcely any adhesions. In the puerperal cases of pelvic abscess, where we have to incise large collections of pus, the adhesions are very extensive, and it is not wise to break them up at the first operation. In other words, it is nature's method of protection, and we should let nature take care of them. In the second operation you will have to break up some very firm, well-organized adhesions, but this is a small matter when you have only the tubes and ovaries to deal with.

The President.—Dr. Davis refers to a class of cases in which he resorts to vaginal incision and drainage. If the patients are not relieved by this method of treatment they generally go to some other practitioner. I may say that 90 per cent. of the cases where this treatment alone is carried out are not well, and they go to other surgeons. For instance, during the last ten days ten patients have come to my hospital for a second or third operation. A good number of have been timid, incomplete procedures.

Dr. Dunning (closing the discussion on his part).—I have very little to say in closing the discussion. There seems to be a misapprehension regarding some statements I made. I distinctly stated that it was entirely justifiable to remove a malignant or neoplastic uterus. This answers the question of Dr. Carstens. It is a life-saving operation.

Regarding the question that was asked by Dr. Rohé, I stated that but one instance out of eighty-four cases of hysterectomy which I have done showed any signs of insanity afterward, and she had evidences of it before operation.

With reference to temporizing in cases of acute pelvic abscesses, it has been my practice for twenty years to do this. I have incised at least twenty abscesses during the last year. Of this number I have had to do a secondary operation in three instances. I have watched some of my patients for fifteen years after incision of a pelvic abscess, and in many there has been no recurrence of the trouble. These patients were my friends. It is perfect folly to say they did not get well. I have delivered some of them of babies since. Neither Dr. Price, Mr. Tait, nor anyone else can convince me that they do not recover. Of course, a certain percentage of them will have to be operated on again. This is as near the truth as I can get. No argument can upset my statements in this regard. There is no question but that we ought to do thorough work.

Finally, I want to say that I have admired our President ever since I have known him. He has been an inspiration to everyone who has observed his successful work. His work, too, has been instructive to me. I have watched every report he has made, and have been guided largely by his work, but I differ from him on this point. His conviction that the idea he advances upon this subject is the ultimate truth is no stronger or more deeply rooted than is mine, that to pursue the course he advocates would with the average man lead to the sacrifice of many lives, which, if the lesser radical method were adopted, would be tided over and carried beyond the danger-point, and would ultimately be restored to health.

Dr. Fish (closing the discussion).—Some two or three weeks ago I called the attention of our local society to the fact that uteri were seemingly being removed in a wholesale way. In our section of the country it has often been remarked that we take out the uterus first and make the diagnosis afterward. If this Association advocates the removal of the uterus every time we take out the tubes and ovaries, it is going to lead to wholesale hysterectomy all over the civilized world. When such a man as Schauta, of Vienna, says that whenever we find a unilateral pus-tube due to gonorrhea, we must remove the other tube and uterus also, it seems to me he is going too far.

Again, it has been remarked that when the uterus is left, after removal of the tubes and ovaries, we frequently have hemorrhages or purulent discharges which do not yield to curettage or cauterization, and that at last the uterus must be removed. While this may be

largely true, if only 50 per cent. of the patients recover, is it not better for us to leave the uterus?

With reference to insanity, I do not claim that I have ever seen a case of insanity follow hysterectomy, but I have had cases of mental "blues" or mental depression in women who seemed to think of nothing else except the fact that their uteri were gone, and I do not know what it will lead to later on.

I have had patients with carcinoma of the uterus who had the mental blues before their uteri were taken out, and who felt mentally improved after they were removed. I have done vaginal hysterectomy sufficiently often to satisfy myself that it is a simple procedure by the clamp, and I shall continue to use the clamp in cases of carcinoma of the cervix until I find I have a large number of cases of prolapse of the vagina as a consequence, when I will probably stop. For high pus-tubes and other pathological conditions of the pelvic organs I shall continue to operate from above.

ABDOMINAL SECTION FOR TUBERCULAR DISEASE.

By THOMAS E. McARDLE, M.D.,
WASHINGTON, D. C.

THERE is at present no subject of greater interest to the human race than the study of tubercular disease, more particularly of its treatment. The enormous mortality from this destructive enemy of mankind renders valuable any suggestion of treatment which holds out a hope of success. It is not the intention here to offer any new method, but rather to formulate, in as terse and concise manner as possible, what has already been done by surgical means for the relief of women suffering from tuberculosis of the generative organs.

Whilst there is only one specimen of tubercular disease of the uterus in the Army Medical Museum at Washington, yet tubercular disease of the female generative organs is far from being a rare disease, as evidenced by the reported cases scattered over many years of medical literature. Almost as early as the recognition of tubercle in the lung tissue have we histories of autopsies revealing the presence of tubercular disease in the tubes, ovaries, or uterus, either in one or more of these organs; as a primary disease of the tube, the ovary, or the uterus, or as a secondary disease consequent to or coincident with tubercular systemic infection. It is true that until the verification methods of modern pathology and the discovery of the bacillus by Koch there was always an element of doubt as to whether many of the cases reported were really tubercular or not; yet with even this element of doubt it is more than probable that the majority of cases would be proven such today, for the reporters were generally clinicians of ability, and the men who made the autopsies were skilled in their profession. It is not my purpose to make reference to the vast quantity of literature, in almost every language, which was so kindly furnished me at the library of the Surgeon-General's Office. It was my intention to

make such an exhaustive study of the subject as was afforded by the material at hand; but so short was the time and so vast the matter at my command, it was deemed best to make reference to the admirable paper on "Tuberculosis of the Female Generative Organs," together with a most complete bibliography up to date of publication, by J. W. Williams, in the *Johns Hopkins Hospital Reports*, 1892. It may be of some little interest to add that, as far as could be learned, Franciscus Deleboe Sylvius, 1680, was the first writer who accurately described tubercles of the lungs; Boyle, 1810, was the first who confidently announced that tuberculosis was not a local process limited only to the lungs; and Addison, 1842, was the first to institute microscopical examinations for tubercle. But, of course, Koch's discovery was the greatest advance of all, and, with the astonishing success of modern surgery, it remains for us to snatch from the jaws of death women who would have been permitted to die from what appears to be so remediable a disease if only the correct diagnosis be made and the proper means of treatment be applied.

There is no doubt that tubercular disease of the female genitalia is more frequent than is generally supposed. Every portion of the genital tract may be affected, the order of frequency for the various portions being: tubes, body of the uterus, ovaries, vagina, cervix, and vulva. The tubes are affected in nearly all cases, the body of the uterus in about three-fourths of the cases, and the ovaries in about half of all cases. It must be borne in mind that such a condition of affairs may exist as a primary disease in one or another of these organs; and this primary disease has for us the greatest possible interest. But we must remember that tubercular disease of the organs just mentioned may be secondary to a focus of infection in lungs, bladder, rectum, or elsewhere, thus casting another element into the question of diagnosis and treatment. Most cases of tuberculosis of the tubes are secondary to tuberculosis elsewhere; but, as far as the genital tract is concerned, the tubes are generally the primary seat of the disease. But the frequency of the primary focus of the disease being situated in the tubes is not properly appreciated, though something has been done of late years to demonstrate that it is of far more frequent occurrence than was ever suspected.

Tuberculosis of the uterus is not at all a rare affection, and has

been frequently discovered in autopsies upon phthisical subjects. It can be the only focus of disease in the body, but it is generally associated with disease of the tubes and is generally secondary to disease of that organ. It seems most probable—in fact, by some it is considered proven—that coitus can be a source of uterine infection with tubercular disease. Yet it has been asserted that frequently from such a cause the tube becomes the primary focus and later infects the body of the uterus. It is well to remember that at first only the endometrium is involved, and the disease does not extend to the muscular tissue until a more or less lengthy period of time has elapsed. Whilst tuberculosis of the ovary has been almost doubted by some and by others considered very rare, yet we undoubtedly have good authority for the assertion that, although it is not of such frequent occurrence as tuberculosis of the tubes and body of the uterus, yet it does occur frequently enough to be reckoned among the prominent localizations of tubercular disease. Notwithstanding the fact that tuberculosis of the ovary is usually consequent upon or coincident with other forms of genital tuberculosis, nevertheless a sufficient number of cases have been reported to lead us to believe that primary tuberculosis of the ovary does exist without the involvement of any other portion of the genital tract.

Senn has well said that the cases of primary tuberculosis of the vulva, vagina, and uterus will undoubtedly become more numerous in the literature of the near future, when improved methods of examination will enable the surgeon to make a positive diagnosis between these affections and carcinoma and syphilitic lesions. We believe that time is now upon us. Enough German and French surgeons and pathologists have reported cases of primary tuberculosis of the vagina to place the existence of that lesion beyond the peradventure of a doubt. Although tuberculosis of the vagina occurs most frequently during the period of greatest sexual activity, yet it has been found in a girl of seven, and again in an old woman of seventy-nine. It is usually secondary to disease affecting the higher portions of the genital tract, the majority of the cases being produced on the posterior wall by secretion from a tubercular uterus.

Williams has advised that in view of mistaking it for carcinoma, the ulcerated variety of tuberculosis of the cervix deserves to be

constantly borne in mind by operators; and undoubtedly tubercular ulcerations of the cervix have not infrequently been operated upon under the delusion that they were of carcinomatous origin. It is believed that further research will prove that, whilst tuberculosis of the cervix is not so common as tubercular disease of the body of the uterus, yet it occurs more often than is generally supposed. Cases are on record where the cervix was the sole location of tuberculosis in the genitals of phthisical women; and, again, on the cervix has been found the only trace of tubercular disease in the woman's whole body.

Of all the female genitalia the vulva is the least liable to tubercular infection. But as progress is made in the study of tuberculosis of the female genital organs greater effort will be made to differentiate more accurately the various diseases of the vulva, and where tubercle bacilli are found, or inoculation experiments yield positive results, the surgeon will have no doubt of the disease with which he has to deal. It is almost certain that more cases of vulvar tuberculosis will then be recorded, and the good results obtained from surgical or medical means may prove valuable in the treatment of tuberculosis elsewhere.

The etiology of tuberculosis of the female genitalia is a subject for much investigation. As has already been said, it is quite generally conceded that the primary form may be the product of coitus, the male having tubercular disease of one or more of his genitals. The fingers or hands of the physician or nurse may carry the tubercle bacilli into the genital tract; so, too, may unclean instruments and syringes be the source of infection. Filthy conditions of the bed linen or wearing apparel may give rise to the disease. It has even been claimed that the tubercular affection may be transmitted through the medium of the air to the female genitalia. At any rate, it may be asserted that the bacilli are introduced by some means, and, finding the conditions favorable, multiply with great rapidity and set up a focus capable of infecting neighboring organs.

Secondary tuberculosis may be caused in various ways. Blood infection is the most probable explanation of the occurrence in very many cases. Tubercular infection has been transferred from the peritoneum to the tubes, and again the peritoneum has been infected from the tubes. Moreover, the bacilli may gain access to

the genitalia from other organs which are the seat of tuberculosis, by the formation of fistulæ between the diseased structure and various portions of the genital tract.

Gehle, as quoted by Williams, stated in 1881, that a positive diagnosis of genital tuberculosis during life was impossible. But since Koch's brilliant discovery such a position is no longer tenable. The microscope will settle beyond doubt the question of tuberculosis affecting the vulva and vagina. If the same means be applied to tuberculous ulcerations of the cervix they will readily be diagnosticated from carcinomata, for which they are most frequently mistaken. Many have been able to diagnosticate with certainty cases of tuberculosis of the uterus in which there was apparently no trace of tuberculosis elsewhere in the system. Whenever there is the slightest suspicion the vaginal and uterine secretions, together with portions removed from the fundus of the uterus by curettage, should be examined with the greatest care, and inoculation tests should be made if necessary. But when it comes to making a diagnosis of tubercular disease of the tubes and ovaries the matter becomes more difficult. It is not so easy to obtain specimens for examination. A probable diagnosis of tuberculosis of the tubes may be made in any case when, in addition to distinct tubo-ovarian masses, we are able to diagnosticate tubercular peritonitis, or, as Osler expresses it, "the association of a tubal tumor with an ill-defined anomalous mass (tubercular tumor) in an abdominal cavity should arouse suspicion at once" (Williams). And the same authority, quoting Edebohls, says the coexistence of tubal tumor or tumors with plaque-like thickenings of the subperitoneal tissues points with the greatest distinctness to tuberculosis. The tuberculosis under these conditions may fairly be assumed to be primary in the tube or tubes if no other deep-seated tumors can be palpated in the abdominal cavity. In one case of pyosalpinx suspected of being tuberculous, Edebohls made a positive diagnosis by an exploratory puncture of the pus-sac, under the guidance of a combined vaginal and rectal touch, and the revelation of tubercle bacilli upon examination of the fluid removed. No one doubts the gravity of the situation when tuberculosis is found affecting any organ of the human body. Though we concede the conservative forces of nature in some instances, yet the progress of the disease in most cases is toward a fatal termination.

Such being the case, any successful effort to remove the offending focus or foci will be hailed with delight.

The treatment of tuberculosis of the vulva, vagina, and cervix does not come within the scope of this paper. The destruction of the tuberculous focus by fluid or solid caustics has been advocated by some surgeons, and, if these means are not satisfactory, extirpation of the part is recommended. We have a very efficient means for the removal of tubercular ulcers of the vagina and vulva in the application of the tincture of iodine. They rapidly disappear under its use. In case of failure, however, excision can be practised. When the cervix is involved, and not the body of the uterus, the method of treatment advised for the vulva and vagina should be given a fair trial; but if they prove ineffectual, no time should be lost in amputating the cervix. When the endometrium is involved there is a diversity of opinion as to the best method of procedure. It has been recommended to first curette the organ and remove all evidence of disease. Iodoform suppositories are introduced into the uterus. If there should be a recurrence of the trouble removal of the organ is advised. Now, if we bear in mind that tuberculosis of the body of the uterus is so frequently associated with the same disease in the tubes and ovaries, it seems to me that, having once ascertained without the shadow of a doubt the existence of tubercular disease in the uterus, it is our duty to look for a similar condition of affairs in the tubes and ovaries; and while we may not make the same exactness of diagnosis in regard to these organs, yet if we can be morally certain of their diseased condition it behooves us to waste no valuable time in curetting the uterus and treating it with iodoform, but to proceed at once to the performance of an abdominal section for the removal of the uterus, tubes, and ovaries. This heroic method of treatment is advocated in primary disease of these organs. In a case complicated with tubercular peritonitis there would be no special danger in removal of the tubes and ovaries. We all know how many cases of that disease have been cured by section and drainage. We could then curette and treat the body of the uterus.

But in a patient suffering from phthisis associated with secondary disease of the genital organs the surgeon has a much more difficult problem to solve. The general condition of the patient must be taken into consideration, and he must weigh well the

chances of life, even if his operation prove a success. In advanced phthisis it is doubtful if it would be worth while to expose the patient or her friends to the care, expense, and risk of an operation so fraught with danger and so devoid of hopeful results. In the early stage of phthisis the surgeon might be led to decide upon an operation if the general condition of the patient warranted it and she were placed in the very best hygienic and climatic environment.

The purpose of this paper will be served, however, if it succeeds in arousing the members of this Association to the importance of the subject and to the vital necessity of making a more thorough pathological study of the organs removed from the female abdominal cavity.

DISCUSSION.

Dr. J. B. Murphy, of Chicago.—Mr. President: My experience in the class of cases mentioned by Dr. McArdle has been very limited. I believe in the radical removal of the appendages and uterus for tuberculosis, whenever it is possible to do this operation without too much mutilation of the parts—*i. e.*, when the tuberculosis does not involve the bladder, intestine or ureter. In the cases that have come under my observation I consider it very difficult to remove the uterus, on account of the extensive tubercular adhesions to this organ, as well as to the tubes. All of my cases have recovered with removal of the tubes and ovaries without removal of the uterus. In every case there was extensive pelvic peritonitis with adhesions—that peculiar type of adhesions which is only seen in tuberculosis—that is, at a distance from the tubercular centre the adhesion is soft and slimy, but as the surgeon approximates the tubercular centre it becomes more and more firm, and finally in close proximity to the original focus it is very friable. We find in the early stages of tuberculosis, where the abscess is not circumscribed or filling the lower half of the abdomen, as it does in some cases, that these adhesions may exist and extend clear across, forming a perfect diaphragm, with the intestines and omentum all above the adhesions and healthy. The original can be recognized by examining the surface of the peritoneum and noting that the miliary deposits are more frequent as we approximate the centre.

I have been very much interested in the process of repair and of

the power of the peritoneum to care for these miliary deposits. I believe the tube is the common origin for the disease. The peritoneum has a wonderful power of repair against tuberculosis, and the cure of tuberculosis is nicely illustrated in studying the pathology and resisting power of the various serous membranes. The rapidity with which the peritoneum will cover the individual miliary tubercle and shut it off from the circumscribed diseased condition is simply marvelous. I believe, with the essayist, that the uterus should be removed if the patient is in a condition to warrant it, but my experience has taught me that the removal of the tubes and the establishment of drainage is all that is necessary in the majority of cases.

The President.—Dr. Murphy agrees with Dr. McArdle as to the common seat of origin of tuberculosis, and that has been the experience of a number of other surgeons. Dr. Murphy's views also agree wholly with the surgical experience of gynecologists as to the character of the adhesions and of the extent of the trouble; also of the well-defined nature of the tubal and ovarian involvement. It is exceptional to find miliary tubercles studding the uterus and its peritoneum, while the ovary and tube are frequently riddled with them, yet the peritoneum covering the uterus will be perfectly free. There will be a well-defined margin about the uterus. Good surgery and drainage cures many of them.

Dr. W. E. B. Davis, of Birmingham.—I enjoyed the paper very much. I think the doctor's conclusions are correct—that the uterus is seldom affected with tuberculosis, and, when it is it is secondary to the tubo-ovarian involvement. Drainage relieves a great many cases of tubercular peritonitis. If the trouble should extend so as to involve the uterus, we can do no better operation than to perform total ablation by the vagina, just as we would for carcinoma of the uterus. We get the most efficient drainage by this route.

Dr. I. S. Stone, of Washington, D. C.—Dr. McArdle has called our attention to tuberculosis of the genital organs, but has said very little which would lead us to suppose that he would include general peritoneal tuberculosis. I think the object of the paper is to direct attention to what might, in the future, prove a preventive measure. He has called special attention to tubercular disease of the cervix and genital organs before the peritoneum is involved. If we can with the aid of the microscope determine the beginning of the disease in the cervix and the doctor's views can be carried out, a great advance will have been made. Practically, I think gynecologists fail to do that. I am afraid that we are getting away from such careful, painstaking search for disease as Dr. McArdle indicates would be desirable. I do

not believe we use the microscope sufficiently often to be absolutely certain of what we find with it. The microscope has so often failed to locate and decide between cancerous and other diseases of the cervix that I, for one, would rather rely upon clinical evidences. It may, perhaps, be better to err on the side of taking out the uterus a little too soon than to leave it so long that there will be danger of extension of the tubercular disease. I see a good many gynecological cases from time to time, and it is seldom that I find anything which I consider tubercular disease of the vulva or of the cervix. Personally, I should be glad to have the discussion include peritoneal tuberculosis and its treatment by abdominal section.

By the way, I am surprised that Dr. Davis should advise doing vaginal hysterectomy in cases of tuberculosis involving the uterus, unless it is one of those cases Dr. McArdle mentions where the disease is limited to the ovary, tube, and uterus, and there are no bowel adhesions.

Dr. D. Tod Gilliam, of Columbus.—I should have said nothing on the subject were it not that Dr. Davis and Dr. Murphy spoke of the difficulty of removing the uterus on account of adhesions. Some eight or ten months ago a patient came to me with general infection of the pelvic viscera. On section I found all the pelvic viscera so completely fused and matted as to preclude any operation in that direction. I then essayed to make a vaginal extirpation of the uterus by *morcellement*, and I found it one of the most difficult undertakings of my experience. After cutting away the cervix and anterior wall of the uterus, the organ still stubbornly refused to rotate into the vagina, and I was compelled to remove it piecemeal up to the fundus. I got away all of the appendages I could, but only partially succeeded in this direction. Gauze drainage was provided for, and a deluge of suppuration ensued. Much to my surprise the patient got well and is now doing general housework.

Tuberculosis of the peritoneum alone is of much less gravity. Not to speak of the almost uniformly favorable results following a simple exploratory section, I believe that many cases come and go without so much as being recognized, and that nature unaided effects the cure. As a rare example of this class, I will cite the following: Two or three years ago a patient came to consult me, suffering greatly with abdominal pain. Examination revealed no tangible cause for her suffering, though I inclined to the idea of tuberculosis. I made section and found the peritoneum in the pelvic region studded with small, angular, calcareous bodies. These were doubtless the remains of degenerated tubercles and pointed conclusively to a spontaneous cure. They

were dug out by the finger-nail and removed one by one until no others could be found. The pain and tenderness—doubtless the result of mechanical irritation—ceased from that moment.

On the other hand, I think we should be careful about attempting anything like a serious operation where there is involvement of the lungs. I must confess to great carelessness in a case of that kind two months ago, in which a woman came to me from Cincinnati, who claimed that she had been examined by twenty-six different doctors, most of them having entertained different opinions regarding her case. I made out an abdominal enlargement with indistinct fluctuation. I did not venture on a diagnosis. I told her that if she was willing to undergo an exploratory incision I would do what I could for her. A sister was in charge of the case. The woman had a bad cough. I made no examination of the lungs whatever, supposing it was an ordinary cold. I made section and found a great hollow cavity in the abdomen extending from the diaphragm to the pelvis. This cavity was lined with a thick, dead-like membrane that could be flaked off with the finger. I found a papillomatous growth in the bottom, which made me suspicious of malignancy. It was impossible to complete the operation. I therefore packed the cavity with gauze and left the incision open. On the second day the woman had a terrific pulmonary hemorrhage; this was followed in a few days by other hemorrhages, and the lungs filled up rapidly; and, although she lived beyond the allotted time which would place the case in the category of deaths from operation, she died within six weeks of pulmonary tuberculosis.

Dr. H. W. Longyear, of Detroit.—The etiology of tuberculosis is exceedingly interesting. Formerly it was said that in tuberculosis of the lungs the patient received infection through the medium of the air. In tuberculosis of the peritoneum it is far-fetched to say that a patient may have received infection through the medium of the air by way of the genital tract.

I had under observation lately the case of a young girl, fifteen years of age, in which it would be out of the question entirely to say that she had received infection by way of the vagina through copulation, and she had no tubercular disease of the lung. There was no tubercular disease in the history of the family on either side. In looking up the matter I found that she was somewhat peculiar in her diet, living principally on milk which was obtained from one milkman, of whom the family had been taking it for several years. As I happened to be connected with the Board of Health of the City of Detroit at the time, I sent our pathologist and milk inspector to secure specimens of the milk. We had the cattle examined, and in the herd we found

several tubercular animals Although it may seem, perhaps, a little far-fetched to some of you that milk may be a source of infection in cases of tuberculosis, I nevertheless believe it. In Michigan we are making quite extensive examinations of the cattle throughout the State, and we find almost every herd infected more or less with tuberculosis. We are trying to stamp the disease out by having these cattle condemned and killed. We have struck a difficulty in the way of adequate law, and just at present we have had to stop our investigations, but I think the work will be commenced again as soon as we can get a satisfactory law enacted.

This matter of infection through the drinking of cow's milk is an important one, and I believe will in the future be considered an etiological factor of importance. In the case of the young girl I spoke of there was a large cyst filling the pelvis and part of the abdomen. It contained clear fluid, with cheesy matter in the bottom; no outline of the uterus or ovaries could be felt, everything being smoothed over with this deposit. Drainage was instituted, and afterward an abscess developed at the side, which opened into this cavity. The operation occurred a little over three months ago, and the drainage-tube is still in use. At first the temperature kept up a little, although now it remains normal, and has been for several days at a time. The drainage-tube is gradually being cut off, and the patient looks as though she were going to recover. I have never seen tuberculosis of the external genitals.

Dr. James F. Baldwin, of Columbus.—I am not going to discuss the etiology of tuberculosis at this time. If I did, I should have some radical opinions to express. I only wish to emphasize one point, and that is the importance of operating not only upon cases of genital tuberculosis, but on all operable cases of this disease. The case Dr. Gilliam mentioned was certainly a discouraging one, and yet the results he has obtained are gratifying. I have a similar experience, in that the patient is apparently well. I wish to report one case which to me is a striking example of the benefit of operative procedures in cases of tuberculosis:

Two and a half years ago a young woman came to me having the typical symptoms of tuberculosis of the lungs and intestines. She also had tuberculosis of the elbow-joint, which was enlarged to the size of a child's head, with numerous sinuses leading into the joint. There was also a sinus leading down to the posterior superior spine of the ilium, where there was evidence of dead bone. She was anemic to the last degree, and had had amenorrhea for something like a year. I examined her carefully, but it did not seem to me that anything could be

done for her. I therefore told her mother to take her back to her former physician, who would give her such palliative treatment as she demanded until death should come to her relief. As, however, something in the way of treatment was insisted upon, I gave her a prescription to relieve the bowel trouble, which seemed to be the source of her chief exhaustion. This symptom being improved by the medicine given, she came to my office again two weeks afterward. I then suggested that as the elbow-joint was a source of great pain to her, disturbing her sleep at night, it might be well to operate upon it. With her consent I opened the joint, hoping to make an incision; but finding the bones too extensively involved, I amputated just below the elbow-joint. Immediate healing occurred, and the girl improved rapidly. A few weeks later she returned to the hospital, complaining of the sinus leading to the ischium. This was opened and the piece of necrosed bone removed. Recovery from this second operation was as rapid as the first, and today the woman is symptomatically well. She has no cough, her temperature is normal, menstruation has returned, and symptomatically, as I have stated, she seems to be cured. I shall, however, watch the progress of her case with interest. I do not think in any of these cases we ought to despair, if they are at all operable. Dr. Gilliam was perfectly justifiable in operating on his case, even if the patient had evidences of pulmonary trouble. The researches of Senn and others show how common tuberculosis is, and how many have it and recover from it where it has never been suspected. Nature accomplishes a good deal, and if we simply do what we can to build up patients, to remove the points of greatest irritation and distress, we can hope with reasonable certainty that nature will assist us, and in a number of instances, at least, will effect apparently a radical cure.

The President.—Nothing is so interesting to us as tubercular disease. Nothing should stay the hand of the surgeon in intraperitoneal tubercular troubles. Statements have been made by a number of operators that they dread adhesions, and look upon them as sacred, and say, "Hands off." This is to be regretted. While an operation for tuberculosis may be tedious, if it is thoroughly done, I scarcely know of any greater triumphs in intraperitoneal surgery than those for tubercular peritonitis. The president of a prominent medical society stated not long since that intraperitoneal adhesions of the small bowel were sacred, and that the surgeon should keep his hands off. This man's mortality has been high in everything he has done.

Dr. Joseph Hoffman, of Philadelphia.—I am glad the question of operating on cases where there is tuberculosis of the lung has been

referred to. I had a case of that nature just before coming to this meeting. The woman had had three or four hemorrhages, and on top of these considerable cough, and at each period a great deal of pain. I examined her carefully twice before I operated, and found one of those large engorgements which extended from side to side over the pelvis, almost simulating inflammatory trouble after miscarriage. I was really in doubt as to the nature of the condition, but suspicion strongly pointed to tubercular peritonitis, and I advised operation. The case turned out to be one of tubercular peritonitis. I had to delay operative interference to reduce the cough, to give her abdominal rest; and the result was the cough stopped. She said that she had not had so much comfort in years since the abdominal pain and cough had disappeared.

So far as symptomatology is concerned, tubercular peritonitis is interesting. I do not know of a single condition that tubercular peritonitis from a symptomatological standpoint does not imitate. I have seen it feign exactly extrauterine pregnancy, with all its symptoms. I have seen it feign, so far as pain and hectic are concerned, pus. In two or three cases which I have in mind I made a diagnosis of ectopic pregnancy. The engorgement in the soft uterus is especially noticeable. So far as rise in temperature is concerned, it is extreme. I operated on a woman, a nurse, whose temperature for months and months had gone up to 104° daily, perfectly regular, and simulated exactly engorgement with pus. An operation showed simply tubercular peritonitis, and the day after the operation she never had a rise in temperature, nor any lung engorgement. In my last cases I used chloroform anesthesia, which has an advantage over ether in that it does not make the patients cough during the operation. The irritation of the lungs must be considered.

The treatment of tubercular peritonitis locally is another thing that deserves attention. The author spoke of using iodine. I think we have a drug very much better than iodine itself, and that is iodoform. It will kill tubercular germs, or whatever you call them, although some objection may be raised to its disagreeable odor. The application of iodoform does seem to aid in clearing out tubercular disease. I recall one case in which half a drachm of iodoform was put into the abdominal cavity. After an incision had been made under cocaine anesthesia, without anything being removed or adhesions broken up, the wound closed, and within one week the woman was out of bed, got into a carriage, rode two squares to her home, and the excruciating pain from which she had suffered had gone. I do not cite this case as ideal surgery; the case was not my own. It seems as though it

was an act of Providence to get the woman out of bed so soon after section.

Dr. Gaston.—Of what did the operation consist?

Dr. Hoffman.—Do you mean in the first case I mentioned?

Dr. Gaston.—Yes.

Dr. Hoffman.—I removed the tubes and ovaries for tuberculosis. That was all. There were no adhesions, but the ovaries were somewhat degenerated. There was no pus. The woman made an uninterrupted recovery and is well today. As an illustration that we should not despair in the presence of absolute suppuration, some time ago I assisted at an operation performed on a woman for tubercular peritonitis. A drainage-tube was introduced and iodoform put into the cavity. I do not think I ever saw so much pus come out of one belly; there was a free flow of pus from the drainage tract. The woman had all the symptoms of suppuration, was very much reduced in weight and strength, and looked as though she had acute general tuberculosis. The operator went away for two or three months, during which time she was placed under my care. We used iodoform, washed out the tube as best we could, and the first question he asked on his return was, "Is Mrs. So and So dead?" I replied that she was not. She is well today, fat and hearty. I do not understand it. It is perfectly justifiable not to lose any chance in saving the lives of this class of patients, especially when the disease begins in the ovaries or tubes.

Dr. Rufus B. Hall, of Cincinnati.—I like Dr. McArdle's paper very much, and wish to discuss one or two phases of it only. The fact that many, if not a large majority, of the cases operated upon for tubercular trouble of the ovaries and tubes recover and remain well without removal of the uterus, it occurs to me, should not, except in rare instances, as narrated by the author, deter us from making a more extended operation and removing the uterus. I have not seen in any instance, even where there was a large quantity of pus on one or both sides, evidence showing that the uterus appeared to be very much diseased. I have seen a number of instances in which the adhesions to the uterus were extensive, but the uterus itself did not seem to be involved in the process as were the appendages. Therefore, in the more broken-down subjects the less operating we can do for the patient the better her chances for primary recovery.

Nature, as suggested by Dr. Hoffman, is a wonderful physician in cases of tuberculosis, in that she cures them after we feel that they cannot get well. It looks to me like doing unnecessary surgery in these cases to take out the uterus when the patient will get well without it. The question of operating upon a patient who has tubercular disease

in the lungs or other parts of the body should be decided by the operator in the individual case. No-hard-and-fast rule can be laid down. Patients stand surgical operations in tuberculosis of the lung and get well the same as patients who have not tuberculosis, in my experience. Many cases will succumb to a severe operation if they have not tuberculosis of the lung. So I would not let that alone deter me from making an operation if the patient had sufficient vitality to justify it. If I had to deal with a patient who had tuberculosis of the lung, and was going to die from that cause within a few weeks without surgical interference, I would advise not to operate. One thing has impressed me very forcibly. It is this: that in not a few cases of tuberculosis the patient has no indication of the disease before the abdomen is opened, and you meet with quite a surprise when you put your finger into the abdomen and find you have a case of tuberculosis to deal with. Such cases do even worse than the emaciated ones—that is, the cases that looked really ill and in whom you suspected tuberculosis before operation. It is in such cases that I have seen a recurrence of the tuberculosis, and the patients die of recurrence some months afterward.

I recall the case of the wife of a young railroad officer in Cincinnati upon whom I operated about a year ago for acute pelvic trouble. There was a mass on the right side of the uterus as large as a cocoanut. The history led me to believe that there was pus present, and that it was of tubercular origin. I removed the suppurating mass in the right side. The uterus was not involved except from adhesions, consequently it was not removed. She recovered in five weeks, went home, and five months later died of tubercular meningitis. One or two other cases, apparently robust and healthy, also died of recurrence in other organs some months after the operation. Physically they looked perfectly well. One weighed about 150 pounds, and I was really surprised to find tuberculosis. Still other cases that have died of tuberculosis afterward were of that class, although the tuberculosis was not suspected before operation. Not any of the patients that were emaciated and looked ill have died of tuberculosis after operation, although there are one or two that I recall just now who have tubercular disease of the lungs, and probably will die later on.

Dr. Wm. H. Myers, of Fort Wayne.—I merely wish in this discussion to emphasize the results of treatment in cases of tubercular peritonitis. At the St. Louis meeting of this Association I related three cases of tubercular peritonitis that recovered after laparatomy, in which I used iodoform.

Dr. Willis G. Macdonald, of Albany.—I do not know that I can add very much to this interesting discussion, except perhaps to say

a word or two on the use of iodoform. I dislike very much to disagree with my friend Dr. Hoffman in anything; but going into practice from the standpoint of a general surgeon, and having had an opportunity to observe the use of iodoform in the treatment of tuberculosis of the hip, ankle, and other joints, and having given it a faithful trial in these joint lesions, I have yet to see any favorable results following it. There is something else in the history of medicine worthy of notice. Some ten years ago iodoform was the favorite drug for treating laryngeal ulcerations. It was sprayed on, dusted on. It was used in the daily work of the best laryngologists in the treatment of tuberculosis, but now they have given it up for lactic acid.

Again, he reports cases in which iodoform was used in the abdominal cavity and followed by unusually quick cures. I think, on the other hand, we might report equally quick cures without the use of iodoform. It strikes me that the incision which is made and the getting rid of the fluid bring about the change. Tuberculosis, when it is accessible as a disease, is fairly curable, even if you do not remove it all surgically. Those who have done resections of the ankle and other joints will tell you that they are not quite sure of having removed all, or even nearly all, of the tubercular tissue, yet healing is a common thing to observe.

In regard to the removal of the uterus for tuberculosis of the genital organs, it is my experience that it is one of the last organs to be infected by tubercular disease. Such tuberculosis as we have associated with the uterus either lies under the mucous membrane or the peritoneum covering it. If it covers the latter, and we are working inside the abdomen, where are we going to stop? Removal of the appendages seems to be quite sufficient in the majority of cases. No man will pretend to say what is going to happen, and I fully agree with Dr. Hall that some of the most unpromising cases after drainage and removal of the appendages get entirely well.

Dr. Albert Goldspohn, of Chicago.—I agree with the statement made by Dr. Macdonald in regard to the removal of the uterus, but I have observed that many surgeons are inclined to think that merely opening the abdomen and getting the atmospheric effect on the tuberculous structures is all that is necessary, and they are content with this. This, however, is not our whole duty in case the tuberculosis begins in the tubes or the uterine appendages, because then it is our bounden duty to remove the tubes and ovaries. We cannot reasonably expect much good from a mere incision, letting the sun shine in a few minutes, and then putting in gauze or even iodoform. The curative powers of the peritoneum are very great. This is very well demonstrated when

we open the abdomen and find the omentum, which is half an inch or more thick, at the lower side of which the intestines are engaged. It is not an easy matter to find our way through. It is even worse than to deal with pus-tubes, and the enucleation of tubercular nodules or enlarged tubes is much more difficult than that of dealing with pus-tubes. It is akin to enucleating carcinoma, because the tubercular infiltration involving the mesentery surrounds the veins, and in removing these pathologic conditions we are very apt to rupture the veins; nevertheless, this is no reason why work should not be thoroughly done.

In primary tuberculosis of the abdomen there are two principal sources of invasion. First, the appendages and the uterus; and the other is the intestinal tract, both of which have been touched upon.

Dr. Longyear has referred to milk-infection. I know of families, supplied with milk from one source, who have been sufferers from tuberculosis of various types. In case infection is from the intestinal canal, we have involvement of the lymphatic structures, the lymph-glands, and ultimately the peritoneum is implicated, and we cannot expect to extirpate the original focus of invasion. In such cases all that should be done is to get the effect of air, of sunshine or light, or drainage, whatever the thing may be that cures, after simply opening the abdomen. Sometimes the tubercular condition is greatly relieved or gotten rid of by the use of iodoform. In other instances it seems to do very little good. But when the invasion is from the appendages, then there is an original focus there which it is our duty to remove, and anything short of this would be incomplete. The two objects that an operation accomplishes are (*a*) removal of the primary tubercular focus in case the disease originates in the appendages, and (*b*) the effect of air or light or drainage, etc., admitted. These two points are embraced in every operation for tubercular peritonitis, and serve to explain why we should not approach these cases through the vagina.

Dr. A. H. Cordier, of Kansas City.—I want to emphasize the position taken by Dr. Price in reference to this subject, particularly in regard to adhesions. Any operation that is done for tubercular peritonitis, leaving a mass of adhesions in the cavity, is certainly imperfect. While the adhesions from an inflammatory condition are in one sense of the word protective in character, because they prevent the invasion of septic material into new territory, they are not always so. Nature stops here in a great many instances in non-tubercular adhesions; but in the tubercular variety, where the tubercles are numerous, they become encysted by the inflammatory process, and an exudate is thrown out. Instead of starving them out or drowning them they multiply, and a destructive process goes on underneath the adhesions

with greater rapidity than ever. In many instances a lateral anastomosis of one bowel into the other is the result of this destructive process which is taking place, if the bowels have become adherent. If we operate for tubercular peritonitis and do not remove the adhesions, we leave the lower part of the jejunum adherent to the cecum, and with the likelihood of approximation of the lateral opening from the jejunum into the cecum we have starvation of the patient following the operation, because the entire contents of the bowel pass from the jejunum into the cecum and out through the rectum, and the patient will starve from the absence of this large amount of absorbing surface between these two points. So we should remove all adhesions when possible in cases of operative tubercular peritonitis.

It has been my experience in this disease that, contrary to the views held by some observers, we do not have fluid in the peritoneum. In the majority of cases I have seen the peritoneum has been dry. The abdomen has not been filled with fluid, and this is a misleading point in our teachings heretofore. Not only has the peritoneum been comparatively dry in many of the cases that have come under my observation, but it has been as red as a piece of raw beef. Quite a large per cent. of these cases get well after operation.

Dr. L. H. Dunning, of Indianapolis.—In dealing with tubercular peritonitis we must differentiate between the dry and moist varieties. Text-books make a distinction of this kind, and it is well made. We have the dry form of tubercular peritonitis, in which, as Dr. Cordier has said, there are extensive adhesions with a dry condition of the peritoneal cavity. In dealing with this form I must say, so far as my experience goes, and it is limited to two cases, there is great danger in breaking up adhesions of the bowel, for the reason that there is great friability of the bowels, with extensive involvement of their serous coats, and immediately on beginning to separate the adhesions we are liable to tear the intestines, making it incumbent to repair them. In both instances in which I operated, the patient died of general tuberculosis in a short time after operation. In five, or perhaps eight, cases on which I have operated, in which there was effusion, every one has recovered.

I take issue with another statement that was made with reference to breaking up adhesions. In the encysted form of tubercular peritonitis we have a disease limited to those portions of the peritoneum having a cavity which is included within the cyst. Occasionally we will meet with a case of encysted dropsy in the lower part of the abdomen in which the upper portion of the cavity is formed by agglutination of intestines and omentum, and in the bottom of it we will find the tubes

and ovaries infected. We will also find the peritoneum infected as well as the walls of the cavity. In all of these instances we may expect a perfect cure, as I have seen in cases of my own, by simply removing the infected tissue as far as possible, as well as the tubes and ovaries, and cleansing out the cavity thoroughly, using a small amount of iodoform and packing the cavity with gauze, following up this treatment until a cure is effected. I am willing to admit it is a tedious process, if we have to carry on these washings and packings for a considerable time; and if we do not get healing from the bottom by granulation, we will have a fistulous opening, when the patient will return for subsequent treatment. If we persist in this treatment, we will effect a cure. I have seen cases where adhesions were broken up above the encystment, in which there was no evidence whatever of tuberculosis, but there was invasion which occurred as the result of breaking up of the adhesions, ending in fistula, and finally lasting until the death of the patient.

There are two sides to the question, and I think there is such a thing as carrying operative interference too far, so much so as to lead us into errors. I think in tubercular peritonitis it is not necessary to break up all adhesions. In one case, in attempting to do this, although we used the utmost caution and care, our efforts resulted in fecal fistula which persisted as the result of ulceration that followed operation. Where the small intestines are agglutinated in the dry variety, one coil on top of another, I believe it is useless to operate.

Dr. Longyear.—I am glad to have heard Dr. Dunning take the position he did. Just a word or two on the question of adhesions. One point with reference to breaking up adhesions of the bowel in tubercular peritonitis was not touched upon. My own experience is that where you break up these adhesions in cases in which the wall of the bowel is degenerated and the peritoneal surface is no longer smooth, but boggy, you are almost sure to get fistulous openings in the bowel, which, when sutured, will not unite. What are you going to do with it? To break up adhesions with this result does not seem to me to be good surgery. I contend it is far better not to attempt it where you have such degenerated masses agglutinating the bowels.

Dr. J. Henry Carstens, of Detroit.—It seems to me, in the present state of our knowledge, we know very little or nothing as to how tubercular peritonitis is cured. When I treated these cases first I tried different kinds of solutions. I tried bichloride, then iodoform, and still later I used nothing, and they got well. There is some peculiar reason beyond our knowledge why these cases do get well after opening the abdomen. If you open the abdomen and take out the tubes, how much does that amount to? There are thousands of miliary tubercles

all over the bowels and peritoneum, and by removing the tubes you do not remove one-tenth, perhaps not one-hundredth, of the disease. I do not care whether you use iodoform, bichloride, or other solutions in cases of tubercular peritonitis, but it seems to me the less you remove the better you are off.

Dr. Hall.—Suppose you have a case where there is an accumulation of pus, what would you do then?

Dr. Carstens.—If I had a tube full of pus, I would remove it. If there is no pus, but simply miliary tubercles studding the uterus, the intestine, or peritoneum all over, I do not see why I should remove the tubes and ovaries, which are not more involved than the intestines in the tubercular process.

The President.—The disputed points in this discussion are of great interest to me. The first is with regard to the dry and wet varieties—the slimy cases referred to by Dr. Murphy. Sometimes when we open the abdominal cavity it is very difficult to free the adhesions in cases of tubercular peritonitis. Our attention should be directed first to the toilet, and second to establish drainage. A good deal depends on the character of the adhesions. In the slimy variety I have freed adhesions in some cases from ileo-cecal valve to stomach, finding it comparatively easy.

What Dr. Dunning has said about injury to the bowel is quite true. I have never been able myself to cure an abdominal fistula in a tubercular case. I consider it the most unfortunate accident a surgeon can have. When you have the dry form of adhesions you use the thumb and index-finger method of freeing them until you can see both sides of the mesentery. In some cases it may require an hour or more of patient work to break adhesions until you have freed them from end to end. I have in several instances worked for an hour in breaking up adhesions.

As to whether iodoform is of any value, it does seem to have some, but in many instances drainage is quite sufficient.

What Dr. Murphy has said as to the primary seat of the tuberculosis and the removal of it is very valuable indeed. What Dr. Dunning and others have said in regard to fistulæ is quite true. There is nothing more distressing than to have a fecal fistula following an operation for tubercular peritonitis. I have known no one to cure one of these cases of fistula.

Dr. McArdle (closing the discussion).—As soon as we devise some method of making an accurate diagnosis of primary tubercular disease of the tubes we will have no hesitancy in removing the tubes and ovaries after such a diagnosis has been made. The peritoneum need

not be involved in the tubercular process when the disease is primarily in the tubes, and, even if such involvement should occur, it would not preclude operation, although ultimate results might not be so favorable.

It would have been well if something had been said concerning prophylaxis. Prevention, of course, is better than cure. Careful study of the male genitalia has made patent the fact that tubercular disease is not uncommon in these organs, and men so diseased should be cautioned as to the dangers of establishing or maintaining marital relations.

DYNAMIC ILEUS.

By J. W. LONG, M.D.,
RICHMOND.

Classification.

Intestinal obstruction has been variously classified, but I regard the classification adopted by Murphy as the simplest and the most rational. ("Ileus." By Dr. J. B. Murphy, Chicago. Reprint from the *Journal of the American Medical Association*, January, 1896.)

1. *Adynamic ileus*, which is always the result of intestinal paralysis, due to varying causes, not necessary to enumerate here; but may be clearly illustrated by such cases as those following injury to the spinal cord, and septic paralysis due to peritonitis.

2. *Dynamic ileus.* This variety forms the subject of this paper and will be discussed in detail later.

3. *Mechanic ileus*, embracing such common lesions as strangulated hernia, intussusception, fecal impaction, etc.

The first (adynamic) and the third (mechanic) are, as we know, very common forms of intestinal obstruction; but the second or *dynamic* form is exceedingly rare; indeed, I have been able to find but one recorded case—Dr. Murphy's, to be referred to presently. Of course, I speak now of cases *demonstrated by operation* and not of the hypothetical obstruction of lead- and ptomaïn-poisoning.

Definition.

Dynamia comes from a Greek word which means power, or force, as exhibited under the form of motion; therefore opposed to stasis. According to Lobstein, it means exaggerated vital activity. As used in the physical sciences the term relates to forces that are not in equilibrium.

When we come to speak of dynamic ileus, it is understood that those forces which preside over and regulate the intestinal canal, have been disturbed, their equilibrium has been lost, and certain factors or portions are acting to an exaggerated degree. Now, this is just what we find clinically in the condition under discussion: certain parts of the intestine are in a state of tonic contraction, because the motor nerves are abnormally stimulated, thus destroying the nice equilibrium that normally obtains. Depending upon the degree of contraction the permeability of the gut is lessened or destroyed. Theoretically, the same thing happens in lead-colic and ptomaïn-poisoning, from ice cream, oysters, and the like. It is more than probable that the theory is correct, but it lacks the clinical demonstration of an abdominal section to verify the hypothesis, as we have in the cases cited in this paper.

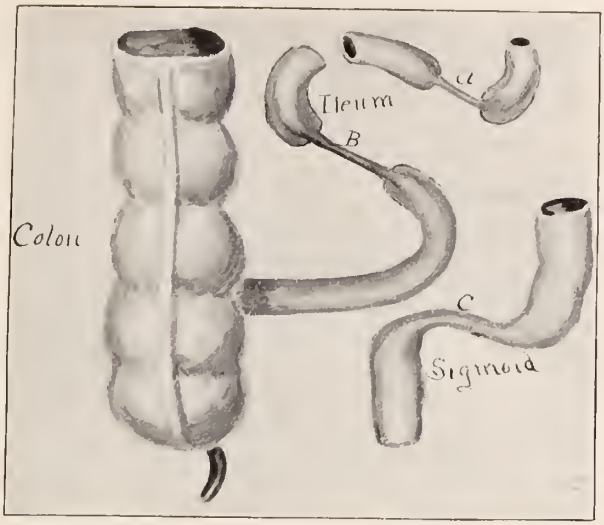
Case I.—Mrs. C., of Manchester, was brought to me by my colleague, Prof. William P. Mathews, on May 27, 1896. She is twenty-one years old, married for three years, but has never been pregnant. She is a blonde, rather below the medium size and height; in temperament she is of the "spoilt-child" type—not hysterical, but rebellious; indeed, Dr. Mathews states that it was with great difficulty she could be induced to have any local treatment or even take her medicines. After coming to the hospital her obstreperous disposition required all the tact and firmness of a sagacious nurse. Early in April of this year this patient had malaria followed by delayed menstruation, pelvio-abdominal pain, and obstinate constipation. The malaria and menstrual disturbances yielded promptly to treatment, but the abdominal pain continued, and gradually the ileus symptoms became more and more pronounced. After exhausting every other measure to move the bowels, the doctor gave the patient chloroform, and, by means of a Ricketts tube, succeeded in washing away a quantity of fecal matter. Notwithstanding there was no improvement, the nausea and vomiting recurred oftener and were more distressing, the pain and tenderness became worse, and a marked degree of tympany supervened. When she was brought to the hospital there had been no movement from the bowels in over four weeks, except what was washed away with the colon tube while the patient was anesthetized. The history justified the diagnosis of intestinal obstruction, while the urgency of the symptoms demanded an

immediate operation. The abdomen was opened by the median incision. No mechanical obstruction could be found, although a careful search was made along the whole length of the intestine. The bowel was moderately distended with gas and congested. A singular feature, however, was that at three points, two in the ileum and one in the sigmoid flexure, the canal was contracted sufficiently to constitute an obstruction. In the ileum one of the constrictions was about fifteen inches from its lower end, and six inches long; the other was nearer the jejunum and about four inches long. The lumen was not entirely closed at either point, but was greatly reduced, being less than half its normal size, while the diameter of the remaining portions of the bowel was increased on account of the distention with gas. No peristalsis was observed, but the contracted portions could be dilated by "milking" the intestinal contents along. In the sigmoid the limitations of the contracted portion were not so sharply defined, but the lesion was just as evident. The walls were thickened and the calibre much diminished. Incidentally, a small ovarian cyst on the right side was discovered and removed. As the intestine had been handled a good deal, the abdomen was flushed with normal salt solution. The incision was closed with two tiers of sutures, silk for the peritoneum and interrupted silver wire for the remaining layers. The recovery was most satisfactory in every way; the bowels responded to the usual laxatives and enemas on the second day; and from first to last there was not a hitch in her convalescence. She left the hospital in four weeks, and three weeks thereafter took a trip to Alabama. I should state that in this case there could be discovered no evidence of lead- or ptomaïn-poisoning.

The next case I cull from Dr. Murphy's article on "Ileus," by his kind permission.

Case II.—"Male, aged forty years. Admitted to the Alexian Brothers' Hospital, June 10, 1894, and referred to me for operation by the attending physician. Patient gave the following history: Five days previous was attacked with a pain of a spasmodic character in the abdomen, followed by vomiting and inability to move the bowels. The abdomen became greatly distended and the symptoms continued up to the time of admission. All efforts to move the bowels by cathartics, stomach and intestinal irrigation were futile. The physician in charge, who had treated him through

FIG. 1.



Case I.—Dynamic ileus. Dr. Long's case. *a* and *b*, contracted portions in ileum; *c*, contracted portion in sigmoid.

FIG. 2.

Case II.—Dynamic ileus. Dr. Murphy's case.

a number of attacks of lead-colic before, believed this attack differed materially from the others, particularly in its duration, which was five days, and the degree of depression. The physical signs showed the abdomen decidedly tympanitic, and an enlarged coil of intestine could be recognized leading up to the right hypochondriac region, where it suddenly terminated. The patient located the pain at this point. It was decided that a laparatomy would be less dangerous than to allow the patient to remain longer with a possible mechanical obstruction. Median incision, omentum withdrawn, and the hand passed up to the right hypochondriac region; the enlarged coil of intestine was grasped, drawn into the wound; with it came eight inches of contracted portion, which resembled a solid cord three-eighths of an inch in diameter, and was as stiff as a rope of that size.

"At first I believed it to be an organic stricture. The intestine above it measured over two and a half inches in diameter and was distended with gas and fluid feces. Below, the intestine was empty, soft, and pliable. After ten minutes' exposure to the air, the spasm at the proximal end began to subside and dilatation gradually advanced to the distal. After twenty minutes the intestine had expanded to about one inch in diameter, was returned and the abdomen closed. The bowels moved within three hours. The patient did not have an unpleasant symptom and left the hospital in ten days. The theory of lead-colic advanced has been that it was due to a tonic contraction of the muscle of the bowel; but from a superficial review of the literature of the subject I cannot find a case recorded where this theory was verified by observation and examination of the contracted portion, as I have noted in this case."

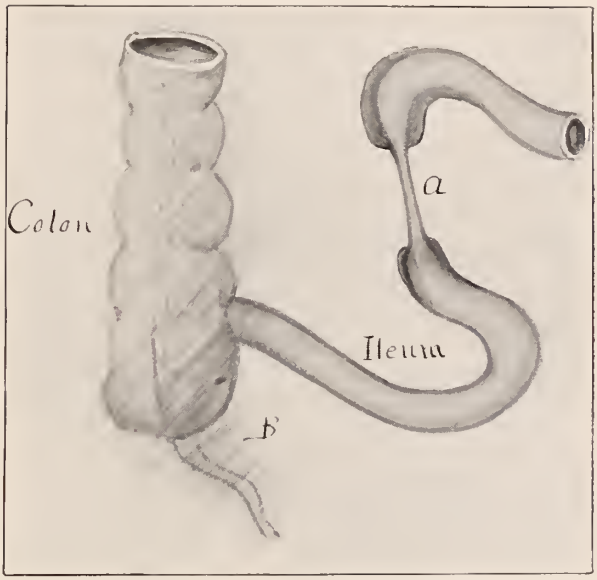
The third case to which I invite your attention was referred to me by Dr. A. Nash Johnston, of Natural Bridge, Virginia. With no desire whatever to rob Dr. Murphy of priority in observing this new and interesting condition, it is only justice to myself to say that this case was operated on and recorded, with a drawing of the lesion in question, several months before I saw Dr. Murphy's paper or had heard of his case.

Case III.—December 18, 1894, W. O. H., aged twenty-one years, was admitted into my service at the Old Dominion Hospital. His record shows that in 1892, or two years before his

admission into the hospital, he was seized with constipation, accompanied by a dull aching pain in the right iliac region and gradually extending over the whole abdomen. He was confined to his bed for a month. In April, 1894, he had an unmistakable attack of appendicitis developing into general peritonitis, which came near ending fatally. From this attack he has never entirely recovered, but suffers continually with abdominal pain and soreness, sufficient to require large doses of morphine, sometimes as much as sixteen grains a day. His condition is further complicated by epilepsy. These seizures began just a day or two before the attack of appendicitis in April, and recurred at irregular intervals of a few hours to a few days. He was sent to the hospital in the hope that to remove the appendix would improve his condition. When admitted he was much emaciated, anemic, and extremely jaundiced.

December 22, 1894, the abdomen was opened by an oblique lateral incision. There were no adhesions to the anterior abdominal wall. The appendix was buried in a mass of adhesions, and a veil of well-organized adhesions containing many bloodvessels covered the lower half of the ascending colon. At a point two feet from the ileo-cecal junction the ileum was contracted for a distance of five inches to one-third its normal size, causing the parts to look as though a section of a very small gut had been let into a large one. While we were observing this curious phenomenon the affected part slowly dilated to near the normal size; the expansion occurred in waves that passed from one end to the other. The appendix, thickened from long-continued inflammation and full of fecal concretions, was removed, but the adhesions over the colon were not disturbed, as they did not seem to interfere with or constrict the parts. The abdomen was closed by two tiers of sutures and without drainage. The recovery from the operation was very satisfactory: the jaundice cleared up, the bowels were easily moved, and the patient gained considerably in flesh; but after a short while the convulsions returned and persisted in spite of all remedies. The after-history of this case is interesting: In December, 1895, the patient's family wrote to me saying he was quite ill with "obstruction of the bowels," and desired to send him back to the hospital for another operation. All arrangements were made for him to come, but he became so sick that he could not make the trip. At this point I quote from a recent letter from Dr. E. P.

FIG. 3.



Case III.—Dynamic ileus. Dr. Long's case. *a*, contracted portion of the ileum; *b*, adhesions covering appendix and colon.

Tompkins, who has seen the patient frequently. This letter gives us some interesting data: "The day before H. expected to go to Richmond for a second operation he became very sick; a knot formed in his abdomen and considerable tympany developed; he was also obstinately constipated. The severe symptoms persisted for thirty-six hours, when the knot disappeared, the tympany subsided, and the bowels moved with great relief to the patient. He always describes his condition as a 'knot' that forms in the middle line just below the umbilicus, which he says is caused by the stoppage of fecal matter in the bowels, and which he claims he can feel move by laying his hand on the abdomen. This 'knot,' as he calls it, has formed ten or twelve times, is always accompanied by constipation, tympany, tenderness, and pain, which is much increased by the least pressure. The epilepsy also continues, but the seizures are lighter. He is now taking about two and a half grains of morphine a day." It seems more than probable that the attacks just described are due to the persistence or recurrence of the contraction of intestines observed at the operation in December, 1894.

I have not attempted to speculate regarding these cases, for not only are we to have the pleasure of hearing Dr. Murphy open the discussion, but I trust that a number of our distinguished fellows and visitors will give us their views concerning this curious and hitherto unobserved lesion.

I wish to say, further, that yesterday I received from Dr. X. O. Werder, of Pittsburg, a Fellow of our Association, the reports of two cases of dynamic ileus occurring in his own practice, which reports I desire to make a part of this paper. He also sent two beautiful water-colored sketches of his cases. So far as I know these five cases are the only ones that have been observed, and we are fortunate in having a careful record and drawing of each case.

Dr. X. O. Werder's Cases.

Case I.—Mrs. W. "Small, round-cell sarcoma," 1 cm. in diameter, of right tube.

Salpingo-oöphorectomy (D.), October 9, 1895.

There was very little vomiting after the anesthetic, and for the first five days the patient's condition was excellent. Her pulse

varied between 76 and 90, the temperature reached 100° once. She expelled gas freely during the first eighteen hours and thereafter, and a free fecal movement followed a saline enema the third day. There was no abdominal distention, no pain, no nausea; the bowels moved spontaneously the fourth day. At that time it would be hard to conceive of a more favorable case.

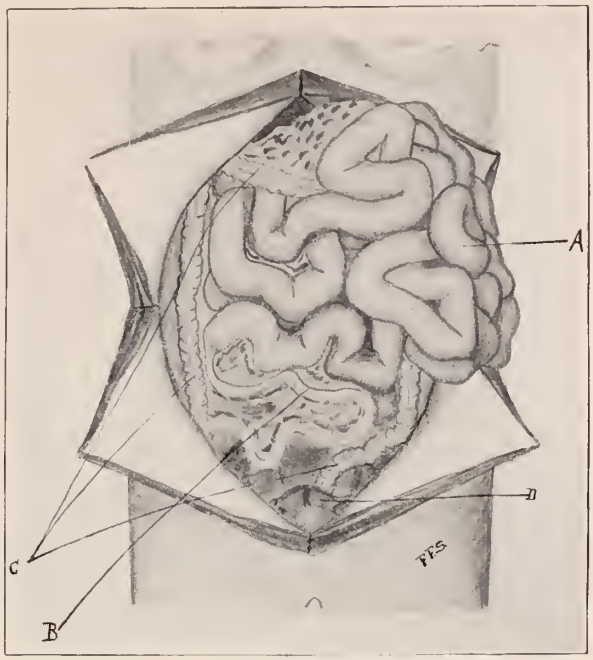
The fifth day she was reading the daily papers, and appeared to be in the best of spirits. That evening she was allowed an egg-nog, and some hours later had severe cramps, was nauseated, and began to retch and vomit. The symptoms were less severe during the following day, but persisted, and became serious two days later. The ninth day she was very nervous and excitable, delirious at times, and was profoundly depressed, with a temperature of 100°, a rapid feeble pulse (150 to 170) that did not respond to stimulation; with nausea, retching, and vomiting that only yielded to lavage, and that for a few minutes at a time; with severe cramps all over the abdomen, with visible peristalsis, and with an abdomen that was flat, but not tense or tender. Cathartics, enemata, tubage, all failed to expel gas or feces at this time, though a small amount had been passed occasionally prior to this date. She gradually sank, till death occurred at 4 P.M. the twelfth day.

It was learned that she had had several such attacks previously, that milk always disagreed with her, and that egg-nog usually caused pain, nausea, and vomiting.

Autopsy. At 8 P.M., October 21st. Incision from symphysis to xyphoid cartilage, and to left of wound. The ileum, distended with gas to 4.5 cm., protruded and was traced down to within 55 cm. of the ileo-cæcal valve. From that point to the anus, the bowel was in a state of firm contraction, the ileum being 1.2 cm., and the whole large intestine 1.2 to 1.6 cm. in diameter. Its peritoneal covering was glistening, normal. No adhesions anywhere; no evidences of peritonitis. The walls of the firmly contracted portion were slightly anemic. A section removed quickly relaxed to its normal calibre, and it contained a mealy substance, probably composed of degenerated epithelium mixed with the scanty intestinal secretion.

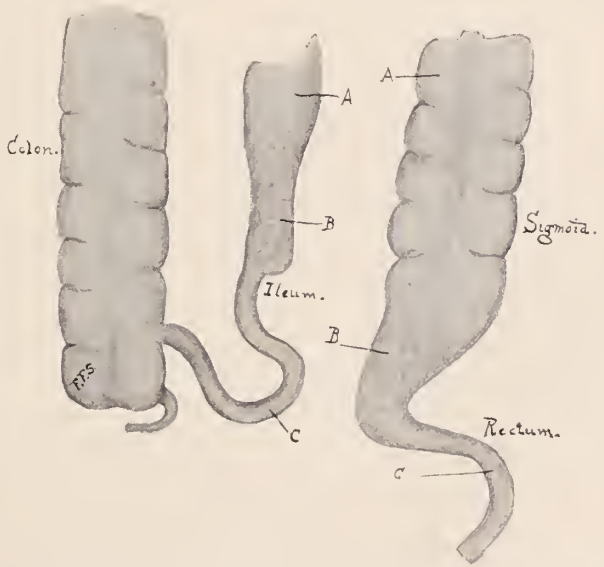
The abdominal wound was firmly healed; the silkworm-gut sutures were covered by smooth endothelium, with no exudate, no adhesions.

FIG. 4.



Case I.—Dr. Werder's case. *a*, small intestine distended to 4.5 cm.; *b*, 55. cm. ileum firmly contracted to 1.2 cm.; *c*, whole large intestine firmly contracted to 1.2 cm.-1.6 cm.; *d*, firmly contracted uterus with ridges antero-posteriorly and laterally, and with its right side anemic.

FIG. 5.



Case II.—Dr. Werder's case. *a*, distended portions of bowel above seat of adhesion to vaginal vault and gauze; *b*, plastic lymph resulting from adhesions—bowel about normal size at this point; *c*, bowel firmly contracted below seat of adhesions.

The pedicle was covered by a smooth, glistening, transparent endothelium, with no adhesions or exudate. It looked healthy.

The uterus was firmly contracted, and ridges were seen in its vertical planes, antero-posteriorly and laterally. Its right side was anemic.

Case II.—Mrs. S. Small uterine fibroid, with marked dysmenorrhea, menorrhagia, and metrorrhagia.

Vaginal hysterectomy, multiple clamp method; uncomplicated, easy.

Operation, June 15, 1896. Very little shock; but little pain and nausea, considerable restlessness. She expelled gas the first day (*i. e.*, before the clamps were loosened). When the clamps were removed she became weak; her skin was cold and clammy; her temperature 97.4°; pulse rapid and feeble. She responded fairly well to stimulation. Numerous attempts were now made to get a movement from her bowels, but neither gas nor feces came away.

The third day after operation the abdomen was soft. There was very little distention, general peristalsis, no tenderness, some vomiting. A very little gas was expelled after one enema. Her pulse-rate had increased from 112 to 132. Her temperature varied from 97.4° to 99°.

About the middle of the fourth day she sank into collapse and died.

Autopsy. Two hours after death. Incision from symphysis to suprasternal notch. Flaps were retracted, and the stomach and bowels protruded. The stomach was distended to a capacity of about 1.5 litres; the small intestines to about 4 cm., and the large intestines to 5.5 cm. by 6.5 cm. These viscera contained gas and about 1.5 litres of a light yellowish-brown fluid. Their walls were thin, pearly, glistening, not injected.

When these distended parts were pulled out the lower part of the sigmoid and 15 cm. of the ileum, situated between 30 and 45 cm. from the ileo-cecal valve, were found adherent to the field of operation. These were of normal calibre, while the rectum and lower 30 cm. of the ileum were contracted firmly to one-third their natural size. Where the contractions began the bowels were sacculated, showing that there had been some attempt upon the part of nature to force the gas through.

On separating the adhesions about 2 c. c. of fluid were found

in the pelvic cavity. There was a little plastic lymph on the ileum and sigmoid, and they were slightly injected at the points of adhesion. No pus was visible to the naked eye. No microscopic examination was made.

There was considerable extravasation of blood beneath the parietal peritoneum around the field of operation, but not more than would be expected.

One of the most interesting and deceptive features of these cases was the fact that the obstruction was not complete, as evidenced by the occasional expulsion of flatus, till the patients were beyond the reach of surgical interference, which was more than once considered very carefully.

DISCUSSION.

Dr. W. G. Macdonald, of Albany.—Mr. President: I would ask one question. We have three illustrations of cases—two by Dr. Long and one by Dr. Murphy. Permit me to ask whether they are fairly accurate of the portion of intestine above and below the point of constriction? They seem to be about equal in calibre; that is, the portion nearest to the ileum and the portion nearest to the cæcum are both of equal size. The intestinal distention seems from the drawings to be precisely above and below the stricture.

Dr. Long.—Dr. Murphy is present and will answer for his case. Speaking of my own cases, in the one where there were three obstructions I can say that there was much difference in the size of the intestine above and below the obstruction. I take it that it was due to the fact that in the case of the two obstructions in the ileum there was also obstruction lower down, which caused the accumulation of gas below the ileum obstruction. In the case where there was only one obstruction, there was some increase in the diameter of the bowel above the obstruction. I do not think, however, it was as marked as shown in Dr. Murphy's case. The illustrations which I have passed around are schematic, and do not pretend to be accurate in their dimensions. They approximate the proportionate amount of constriction as compared with the normal bowel.

Dr. J. Henry Carstens, of Detroit.—I have seen one case, post-mortem, which was shown to me by a friend because of this very condition. The contraction was very extensive, but I must confess that

it is a subject I know very little about. The question is, Is this a paralysis of a certain nerve supplying that part of the intestine, or is it due to embolism of some of the small arteries supplying the mesentery in that particular locality? It seems to me it must be one or the other. Still, the reports of cases in which the patient gets well would naturally make us exclude any nervous origin of the trouble. However, with the record of recurrent attacks in the last case of Dr. Long, it would make us think it was of nervous origin; that there was perhaps some reflex action, some injury or irritation of a nerve supplying this particular part. It may be an enlarged lymphatic, it may be pressure or the irritation of the nerve by certain movements of the patient, or it may be brought about by the ingestion of a certain article of food that causes this peculiar condition. We will find quite a number of such cases.

Dr. Wm. H. Myers, of Fort Wayne.—While Dr. Long is looking for his specimens, I desire to say a word upon this subject. I will read part of the report of a case by Keith, of Edinburgh, in a recent work. (Here Dr. Myers read the paragraph alluded to.) I wish to say that a book was written upon this subject by Henry Hurot as far back as 1865, so that the subject has been investigated to some extent. He divided paralysis of the intestines into three classes: First, direct paralysis of the intestines due to a change in its walls. Second, indirect paralysis dependent upon reflex action. Third, paralysis which affects the nervous system. In the first form the intestines are strangulated, and the strangulation is reduced either by taxis or operation, while the patient is under the influence of an anesthetic. The autopsy reveals no mechanical paralysis of the intestine. In those cases of persistent constipation an autopsy reveals no mechanical obstruction from any cause. I wish also to call attention to arrest of peristalsis. (Here Dr. Myers again read from Keith's work.)

Dr. D. Tod Gilliam, of Columbus.—While the matter which Dr. Myers has read is interesting, I think it is crowding out the discussion of the subject at issue. The question is not on paralysis of the bowel.

Dr. Myers.—It is so classed in a book written by Keith, which is as good an authority on the subject as the gentleman who called me down. Keith is a man of superior attainments, and during his time no one has ever questioned his diagnosis of a case.

Dr. J. B. Murphy, of Chicago.—I have nothing specially new to offer upon the subject of the very interesting paper which Dr. Long has brought before the Association. He has thoroughly covered the ground, and I have had no case since the one alluded to in the published report.

I wish particularly to answer the question of Dr. Macdonald as to the size of the intestine above and below the seat of obstruction. The drawing shows the contrast between the size of the intestine above and below the point of obstruction—*i.e.*, it is more than twice as large above as it is below. That is very important in the diagnosis; it is also important in making a differential diagnosis at the autopsy as to whether the obstruction is a pathologic condition that existed before death or whether the contraction is one that occurs post-mortem, a condition that we not infrequently see. If it be a post-mortem contraction, then there is no dilatation of the canal above that point. If it be an ante-mortem contraction—that is, if you have an obstruction which has existed for a long time—then you have dilatation, and the degree of dilatation depends upon the length of time and the degree of obstruction.

Lane, of London, reported a case upon which he operated where the circumference of the small intestine was thirteen inches just above the obstruction, and below it was contracted. In my case, which is underdrawn, I made a diagnosis of the portion of the obstruction from an enlarged coil of the intestine that led up on the right side to the seat of the obstruction. You can see the enlarged coil of intestine through the abdominal wall. That is very common. If you will watch these cases carefully, it is surprising how you will recognize the position and size of the intestine, as well as locate the position of the obstruction. In locating the position of the obstruction we must observe, first, the position at which the patient locates the pain. I consider this very important. Second, the position at which the enlargement of the intestine terminates.

The specimen which I present to you illustrates the comparative size of the intestine above and below the obstruction very well. This case gave a history of obstruction of three years' duration. It is an organic stricture, and not a spasmodic or dynamic stricture, as treated in the paper. This specimen has been preserved as it was removed. I kept the case in the hospital for ten days to show the visiting physicians how readily we can make a diagnosis of intestinal obstruction from *physical signs*. The patient had repeated attacks of colic. The first attack came on while visiting the World's Fair. The attacks occurred first every month or six weeks, and increased in frequency until finally they occurred daily, more commonly after she partook of a hearty meal. The pain would commence on the right side of the abdomen, and was directed to the left and a little below the umbilicus. Placing the stethoscope over the opening as the pain subsided you could hear a sizzing sound as distinct as a cardiac murmur.

Some one might question the diagnosis in Dr. Werder's case as to whether it was an ante- or post-mortem contraction. If there were marked dilatation of the canal above the position of constriction, then I would say it was ante-mortem; if not, a post-mortem contraction.

Dr. Macdonald.—In the discussion of Dr. Long's paper we have to deal with a very unusual and, at present, we may say, obscure condition. In considering Dr. Long's case, as well as Dr. Murphy's, from a purely pathologic standpoint, we must take into consideration the mechanism of cure. As I understand it, nothing but opening the abdomen and bringing the portion of constricted intestine into view, and waiting for an interval until there was relaxation of the bowel, was done. Now, if the bowel presents in that way, it must be the result of some local disorder of the nervous mechanism, of the circular fibres of the intestine. It can be nothing else. If it were due to thrombosis, as suggested by Dr. Carstens, why should simple exposure of the intestine to the air relieve this condition of thrombosis or enlargement of any gland in the mesentery? That theory would seem to be hardly tenable. Why does it cure? Is it simply the exposure in handling, or is it the effect of the anesthetic on the intestines? Now, if this condition continues, and can be discovered post-mortem, it ought not to be due to any disorder of nervous mechanism, because when a man is dead paralysis of nervous function disappears. Then there ought to be no pathologic condition post-mortem which ought to disappear if it is due to a disorder of the intestines.

In the matter of diagnosis we should really be able to determine the condition particularly after operation. We have an organic stricture and a condition of distention of the intestine very often by bands. I have had opportunity on several occasions to do secondary operations for the relief of these bands. One of the Fellows of the Association present doubtless remembers the case I operated on five or six days after a primary abdominal section was done, in which the intestines had been cut off, and all the physical signs detailed here could be easily determined, and the wound was reopened. I put my finger right on the band, lifted it so as to show the point of constriction, and then inserted four or five new sutures. The same thing has happened in days gone by as related to pedicles after the removal of the uterine appendages, but less frequently now than it used to be, for we deal with the pedicle now somewhat differently. It is an obscure condition, and I think we all agree that we have done little toward elucidating it from a pathologic standpoint, although we occasionally explain how we relieve it by abdominal section. Whether free doses of antispasmodics may not do as well as abdominal section is a question.

Dr. A. H. Meisenbach, of St. Louis (by invitation).—I can fully corroborate what Dr. Murphy has said in relating the symptoms of the first case which he reported—namely, the presence of the coils of intestines in cases of ileus being clearly definable through the abdominal wall. I had such a case in which the intestinal obstruction occurred after an operation for femoral hernia. The case was a poorly nourished woman who had femoral hernia which had existed for three or four days before I saw her. I operated, reduced the hernia, and for a few days she did nicely; all at once symptoms of obstruction began to manifest themselves, and, the condition of the abdominal wall being thin, I could plainly see and feel the coil of intestine as it began to roll up, accompanied with symptoms of pain. The case was shown to several of my colleagues, and the universal opinion was that we would ultimately have to reopen the abdomen, search for the seat of obstruction and relieve it.

In searching through the literature I came across a work on electricity, written by Bigelow, and in that work there were cited some cases by a French surgeon, in which he advised the use of electricity in cases of paralysis of the bowel. The thought struck me that electricity might possibly be a good remedy to use prior to operative interference in this case. The faradic current was used according to the method laid down—that is, placing one pole in the rectum (in salt solution) and the other over the abdomen and on the tongue. The method of running the current through the tongue is not given in the work of Bigelow. Some years ago I did some experimental work along this line, and the method proved useful in moving the bowels. After the first attempt with electricity it was found that the symptoms were somewhat relieved. Daily applications of it were kept up in conjunction with the internal administration of strychnine, so that after a week's trial of the method the symptoms of obstruction were relieved, and ultimately the woman recovered.

I reported this case at the St. Louis Medical Society, and one of our renowned neurologists (Dr. Bremer) questioned the action of the electric current in the manner I described. But it is a fact, nevertheless, and it can be easily demonstrated by the use of the current in that way. One of the sequelæ of abdominal operations is that intestinal obstruction occurs. Just how it occurs, or what the causes of the obstruction may be, is a question, and I do not believe that it has been satisfactorily solved. I believe in the case I had under observation that the obstruction was due to a depraved condition of the nervous system. The woman was below par at the time of operation; had been under poor surroundings, and her system poorly nourished. Along with the

aid of electricity, strychnine, I believe, is a remedy that is indicated in conditions where we have this paralytic condition of the bowel; and, although I do not believe it effects a cure in every case, yet, if we have time to temporize, it may be a procedure that it might be well for us to try before we reopen the abdomen. Reopening the abdomen after operative procedures is not always advisable, because we again subject the patient to additional shock, and the operative interference in handling the bowel must have some effect upon the patient's welfare. If we can overcome the obstruction by medicinal or mechanical means in cases that will bear temporizing, they should be tried first before operation is again resorted to.

Dr. Joseph H. Branham, of Baltimore.—I want to ask a question or two before discussing this subject. I do not know whether we are discussing two different conditions or not, but I would like to find out. It seems to me in the report of the case by Dr. Murphy we are discussing the condition of spasmodic contraction of the bowel, and I do not understand whether that condition is associated with paralysis or not. I should think probably it was not. The term is applied to a paralytic condition according to the discussion which is going on. I would like to know if the cases reported by the gentlemen were due to paralysis, inasmuch as they spoke of narrow constriction.

Dr. Murphy.—No, sir; not in my case.

Dr. Branham.—Do you not think it would be well to find out now just what we know nothing about? The term has been applied heretofore to paralysis of the bowel, and the discussion is applying it to paralysis of the bowel also. If these gentlemen have reported cases of spasmodic contraction of the bowel persisting after death, let us discuss that feature.

Dr. Murphy.—I did not report a case in which the spasmodic contraction occurred after death. In my case the spasm was ante-mortem under chloroform, and the title of the paper was "Dynamic Ileus," and before mentioning that class of cases I alluded to the paralytic variety. I believe it was not considered in Dr. Long's paper at all, and we are discussing the dynamic variety—excessive muscular contraction.

Dr. Long.—Dr. Murphy is right. We have made a sharp distinction between cases of paralysis and cases of excessive muscular contraction.

Dr. Branham.—What about the case reported by Dr. Werder? Was that adynamic or dynamic? I should think it would belong to the dynamic variety of obstruction as well as the other cases. I do not see any reason why this condition of contraction should not persist for a few hours after death.

Dr. Long.—I propose answering these points in closing the discussion.

Dr. Branham.—It seems to me doubtful whether the spasmodic contraction which occurs in a patient is continued after death. Of course, there is a condition of constriction of the bowel after death which is supposed to be associated with the same condition in the muscles of the body—a *rigor mortis* affecting some parts of the bowel more than others. I do not believe a spasm of the bowel before death that would cause symptoms of obstruction would persist any time after death. The paralytic condition of the bowel, which unfortunately has been described in articles in text-books, is erroneously designated as dynamic obstruction. But this is the term that is frequently used in describing this condition. Below the point of paralysis the bowel is constricted more than usual, and I think, if the paralysis has persisted for some days and the dilatation is great, it might persist a certain length of time after death; but I do not believe that an active spasm would continue for a long period of time after the death of a patient. In the case reported by Dr. Werder the obstruction was more likely due to paralysis with a certain amount of constriction below the paralyzed point than to active constriction. I doubt whether active constriction could exist so as to produce death. Of course, we could have it, but not sufficiently marked to kill anybody. These fatal cases must be considered paralytic. The point I make is that the cases of reported constriction after death are cases of obstruction of the bowel from great dilatation above and a moderate amount of accidental constriction below, but not of spasm of the bowel. I do not believe spasm of the bowel itself would kill any patient. However, it is quite possible to have persistent spasm at one point, but not sufficient to produce death.

The idea that the obstruction can be due to paralysis from an infarct in the cases reported would hardly seem possible. The symptoms of infarct would be so decided that it could not be overlooked on account of the intense engorgement and extravasation of the tissues involved.

Dr. Gilliam.—It seems to me the members have been scattering a good deal in discussing this subject, and I am glad that we are coming back to the consideration of dynamic ileus. This is a comparatively new, though no less important, subject, and one which I think ought to have free ventilation. There is evidently a spasm of the bowel at the place of obstruction. There does not seem to be from the history of the cases any evidence whatever of a paralytic condition. If the obstruction depended on a paralysis of the bowel, we would not have the borborygmus which we find described in these histories. Now spasm is an indication of disordered nerve force. It requires vital

energy to produce and maintain a spasm. When the vital energies are reduced to low ebb spasm must cease. Spasmodic croup is a familiar instance. When suffocation is imminent the spasm gives way because there is not enough vital force left to maintain the spasm. So it is with all inhibitory processes. A muscular spasm will always let up before death; it cannot persist after death. There may be a post-mortem rigidity, or there may be atrophy of the bowel. I have in mind now a very marked illustration of atrophy of the bowel which occurred in a case of intestinal tuberculosis, in which part of the bowel —a number of feet of it below a certain point—underwent atrophy to such an extent that it was not one-quarter the size of the original bowel. It may be that the fecal poisons have something to do with this. I am inclined to think that certain poisons that are propagated in the feces might have an effect on segments of the bowel in the way of producing a spastic condition of the same. Poisons will accumulate in the intestinal tract as the result of obstinate constipation which will exert their baneful influence in different ways. As to the possibility of a person dying with this condition I am not so sure, but am rather inclined to think that cases may terminate in death on account of the bowel becoming exhausted in trying to empty itself before relief comes through an exhausted nervous centre.

The President.—Some years ago Dr. Murphy was in Philadelphia, and while there demonstrated the difference between the distal and proximal side of the intestine. He has called attention to it today. These points are always of value and of interest to us in considering intestinal obstruction.

I remember very well a case of chronic bowel obstruction in a man that was treated for some two years by two Philadelphia surgeons. I did a section, and while emptying the bowel, larger than my waist, the bowel coats as thick as the cloth of a winter overcoat, a gentleman visiting me at the time thought I was removing a huge ovarian cyst until he recognized the whiskers of the patient.

Some years ago a brilliant young physician, a Dr. Harvey, of Germantown, suffered eight years with spasmodic obstruction of the bowel and came very near dying many times. He received the attention of skilful physicians and the careful nursing of the Germantown profession. He finally died with a diminution in the lumen of the bowel for some six or eight inches without adhesions. No report was ever made of this case.

Dr. Logan, of Scranton, sent me a patient some years ago who had had one or two operations. I did a double ovariotomy, and the woman made a good recovery. She lived for some years, progressive emacia-

tion followed, with an agonizing intraperitoneal pain, which lasted for years, and she finally died. There were found post-mortem multiple points of contracted intestinal lumen in her case. Dr. Logan has the specimen. The next time I see him I shall ask him for it and make a microscopical examination.

Some two weeks ago I was called by Dr. Ewing, of West Grove, to see a case of intestinal obstruction in a colored woman. It was a case of volvulus (?). When I opened the abdomen I found a collapsed small bowel, and in tracing the bowel to the point of distention I at once attempted to "milk" the contents into the collapsed portion of the bowel, but there manipulation resulted in failure, and I decided it was perfectly hopeless to make further attempts, as we would certainly rupture the bowel. At a number of points the same condition existed that is shown in these drawings. We had an enormously distended ascending and transverse colon, and I recognized at once that I had obstruction, although at first it seemed to me I had a solution for her symptoms. I recognized during my manipulations that something existed above the distention. The shock or paralysis due to mischief at other points might have been responsible for her symptoms. I extended the incision and found the large bowel with bands of adhesions. I liberated these bands with scissors. I then incised the transverse and ascending colon at two points, emptied the solid and gaseous contents, and stitched the bowel. I looked upon the case as absolutely hopeless. The woman received a very large dose of strychnine. She made a happy recovery.

I recall in this connection a case of Dr. Morton's while resident physician in the hospital, in which the abdomen of a man was opened and the mesentery repaired. The wound was closed, and the patient placed in bed almost pulseless. Dr. Morton was then using strychnine for shock. A grain of strychnine was given hypodermatically. The patient arose in a few hours thereafter, threw a negro out of the window, and recovered.

While I have referred to Dr. Logan's case, it does not throw much light upon Dr. Long's interesting paper. Dr. Ewing's colored woman has recovered. In less than twenty-four hours she was passing flatus. The bowel was nearly as large as my coat-sleeve, collapsed, and looking like a dish-cloth. There was a diminution in the lumen of the small bowel at several points. It was impossible to force gas one-sixteenth of an inch, or by any manipulation to restore the normal lumen of the bowel.

In ectopic pregnancy we sometimes find the abdomen full of blood, with mutiple points of diminished bowel lumen. We recognize at once

the contracted condition of the bowel. Other points of the bowel are distended. With the presence of a quart of blood in the abdominal cavity, the condition of the bowel would result in death. I have found this state of things repeatedly in ectopic pregnancy.

A few days ago I was assisting my brother in a case in which there were multiple strictures of the bowel, as well as in a case last week of bowel obstruction, and I am satisfied that the growth of the tumor and the obstruction in one case occurred at the site of an old slough due to volvnlus. I believe spoutaneous recoveries of children with intussusception may result in a condition of this character unrecognized at the time of operation.

Dr. Long (closing the discussion).—I am gratified at the discussion which my paper has provoked. That a patient may have intestinal obstruction from spasmodic contraction of the gnt, even resulting in a fatal issue, there can be no qnestion. The cases reported certainly establish the obstruction, the lesion as observed at operation, and the favorable results of abdominal section in overcoming the obstruction. The autopsy cases show clearly that the lesion may produce death.

I want to say further that Dr. Gilliam is quite right in calling attentiou to the fact that the paper was not upon *paralytic forms* of obstruction, and that paralysis of the bowel is not germane to the subject at all. Of course, we are all familiar with the work of Keith, and all of ns who have seeu much abdominal surgery have noticed numerous cases of obstruction of the bowel due to paralysis. This is nothing new, but we make a sharp distiuction between cases of paralysis and those due to the condition under discussion today. Neither are the teachings of Dr. Stillé pertinent to the subject. The kind of obstruction that he talked of was probably not due to a contraction of the bowel, but also falls under the head of paralysis or adyuamic ileus; many such cases are due to inflammatory conditions, aud it is those conditions which can be cured, many of them, by warm applications and small doses of opium, rest, etc. I call attention to the fact that while Dr. Stillé showed *pictures* of supposed contraction of the bowel, he did not show the *inside of the abdomen.* Had he done so, he would probably have found a dilated gut from paralysis, instead of a contraction. A further proof on this point is that cases of dynamic ileus are not cured by rest, opium, or even by inhalations of chloroform or ether. In one of the cases which I reported today the spasm occurred while the patient was taking as much as sixteen grains of morphine daily. In all three cases reported by myself and Dr. Mnrphy the spasm persisted during the anesthesia, and only gave away slowly after the abdomen was opened.

Dr. Macdonald says that he did nothing except to open the abdomen, pull out the bowel, look at it, and close up the wound, and that we have really done nothing. It may at least be said that both Dr. Murphy and myself observed the lesion in question, made careful records of the cases at the time of operation, and the patients got well, neither of which has been done in Albany, according to the latest returns.

Dr. Macdonald.—I have a question to ask you, Dr. Long. Did you not say in your report of one of the cases that the patient subsequently suffered from similar attacks to that for which the operation was done, and that he is not alive today?

Dr. Long.—The man is alive today, two years subsequent to the operation, and that, too, in spite of the fact that since then he has had eight or ten attacks of threatened intestinal obstruction which were probably due to the same condition of contracted bowel found at operation.

Dr. Carstens spoke of the obstruction as possibly being due to some nervous origin. I think quite likely he is right, and I call especial attention to the fact that one of my cases, the man who was taking large doses of morphine, was an epileptic. The young woman was also of the neurotic type. They were exceedingly nervous patients, both of them.

Dr. Meisenbach referred to a case that was diagnosticated without operation, and then cured by electricity. I want to say, without any reflection upon his diagnosis or upon his treatment of the case—for I recognize Dr. Meisenbach as equal to any man on this floor—that it sounds very much like electrical diagnoses and cures made from the outside of the abdomen, and not by abdominal section. Undoubtedly there was obstruction in the cases he mentions, but it was probably due to paralysis, as Dr. Werder suggests, and as such does not bear upon the question at issue.

Dr. Gibbons.—Will Dr. Long and Dr. Murphy let us know whether or not they resorted to abdominal section and exposed the tube, or whether they used hot water, hot cloths, etc.?

Dr. Murphy.—Before or during operation?

Dr. Gibbons.—During the operation. I believe you said that under observation of about ten or twenty minutes the spasm in the bowel gradually subsided. This is a very interesting point, and we are anxious to know whether or not, if you used any hot fluid, it contained chloride of sodium, which is the most efficient agent for use in the peritoneal cavity?

Dr. Meisenbach.—I would like to make a statement in regard to electricity. I am not a crank on that subject, neither have I any use

for people who treat patients by electricity alone. In the case I reported I thought the diagnosis was clearly made of obstruction of the bowel, either of the dynamic or paralytic form, and from that standpoint, and for the welfare of the patient, I felt I was doing what was perfectly justifiable, though I felt at the time that it might not have any effect, and that I would have to open the abdomen and locate the obstruction.

Dr. Murphy.—In the case mentioned we made no application whatever. The bowel was simply exposed by abdominal section, examined, but no special applications made to it.

Dr. Goldspohn.—How long did you wait until relaxation took place?

Dr. Murphy.—I should think about ten minutes. This is merely an estimate, as I remember the case. I did not use any solution whatever.

SPONTANEOUS RUPTURE OF UTERUS DURING LABOR AT TERM.

By B. M. HYPES, M.D.,
ST. LOUIS.

Through the kindness of my colleagues, Drs. Wiehmann and Meisenbach, of St. Louis, I am enabled to present this interesting history and unique specimen.

Mrs. O., aged thirty-one years, of German parentage; general health good previous to birth of first child; no history of any constitutional disease. About one year after marriage, aged twenty-six years, she was delivered of a seven-and-a-half months' child, which lived but a few minutes. This labor was easy, lasting about six hours. The midwife in attendance failed to get the after-birth, which was removed by the family physician, twenty hours after the birth of the chid, by means of his hand and the curette. She then suffered for six weeks with a severe metroperitonitis. From this time her health remained impaired, and for the next few years she was a sufferer from general debility, impaired digestion, and a "sore spot" in the hypogastrium. Four years from the birth of her first child she again became pregnant. During gestation her general health was much improved. She exhibited no functional disturbances, her only complaint being of this "sore spot" over the fundus of the uterus to the right of the median line.

Labor pains began September 16, 1895, at 10 P.M., at term. The family physician, Dr. Wichmann, was called and found labor in progress, vertex presentation, with normal condition of mother and child. The pains being slight and progress slow, at 2 A.M., September 17th, he gave a dose of morphine and went home. This was the only medicament used in the case. At 9 A.M., upon his return, he found the patient comfortable, with occasional slight labor pains. He left the house with the injunction to call him when signs of labor became pronounced. Patient remained quiet

during the day, relished her meals, and at 2 P.M. lay down for a sleep. Suddenly at 3 P.M., as described by the husband, she was seized with violent vomiting, followed by the most excruciating pains in her abdomen, associated with rolling and tossing in bed, gasping for breath, faint feelings, pallid face, and rapid exhaustion—in short, the usual symptoms of abdominal shock. The family physician was at once sent for, and upon his arrival, at 4 P.M., found her in complete collapse with convulsive seizures.

Rupture of the fundus uteri. (HYPES.)

The symptoms, with vaginal and abdominal examination, revealed to him this dreadful condition: the presenting part receded, the womb empty, and the child plainly felt in the abdominal cavity—the patient had suffered a spontaneous rupture of the uterus. He at once despatched for surgical aid, but by the time the surgeon, Dr. Meisenbach, arrived, the patient was moribund. Still, with the hope of saving the child, section was hastily performed, and the child, which had escaped entirely into the abdominal cavity, was extracted from a mass of blood and amniotic fluid. It had ceased to live, and continued efforts at resuscitation failed to

cause it to breathe. The child was a fully developed male, weighing six pounds, and was eighteen inches in length.

The uterus, when removed from the body, presented the following conditions: A rupture through fundus superiorly, extending from half an inch from the entrance of one tube to an equal distance from the entrance of the other; the walls at the place of rupture were comparatively thin; placenta located at middle third of the uterus, anteriorly and to the right, where the walls were much thickened; the vaginal portion of the cervix was almost obliterated, as at term, and dilated for the ready admission of two fingers; lower zone of uterus exhibited no thinning or formation of Bandl's contraction ring; no disease of tubes, ovaries, or placenta.

Microscopical examination, made soon after rupture, revealed fatty degeneration of tissue at point of rupture.

The points of unusual interest in this case are the cause of the rupture and its location at the fundus uteri.

Since the classic treatise of Bandl in 1875 the trend of professional opinion certainly favors uterine contraction, associated with dystocia, as the most frequent cause of spontaneous rupture of the uterus during labor at term. With this theory no fault is found. Great credit is due Bandl for his acumen in studying the changes which the uterus undergoes in labor, and the gratitude of the profession and of the whole world is due him for the many lives saved as the result of his teachings and writings. The criticism to be made is that writers and teachers, in their earnest desire to impress the importance of this one cause, should not ignore other causes. In several of our recent American publications—most excellent works they are, too—no allusion is made to disease or traumatism as predisposing or exciting causes of uterine ruptnre during labor. Here in this case, from the history as obtained from the attending physicians and an intelligent husband, we have a rupture of the uterus during labor, produced, as I believe, by a violent attack of vomiting, having as a predisposing cause an organ vitiated by a previous metritis, endometritis, traumatism from adherent placenta, with thinning of walls, fatty degeneration, and a probable local inflammation as indicated by the "sore spot" at the fundus. The continuance of this sensation of localized pain is worthy of note in this case, as the rupture occurred at this point.

Murphy, as quoted by Barnes, says "that alteration or disease of the uterine wall was frequently indicated by such a painful spot."

Duparcque and Harrison relate cases of rupture during *pregnancy* from vomiting. Why should not the same accident happen, with favorable conditions, during labor? Winckel says: "Straining is evidently sufficient to produce rupture in all cases of disease of the uterine walls." Trask says: "Inordinate voluntary exertion deserves to be enumerated among the causes of rupture of the uterus." The many cases reported of spontaneous rupture during pregnancy forcibly argue that diseased conditions of the uterus play an important *rôle* in etiology of spontaneous rupture. To quote from Jolly: "Contractions of uterus would not cause rupture without disease of tissues." Finally, the well-known predisposing causes, such as frequent childbearing, women over forty years, enfeebled constitution, hard life, poverty, previous Cesarean section, and fatty degeneration, indicate that the uterus partakes of the general degradation of tissue, and is thereby prone to rupture.

The second point of interest is the *location* of the rupture. It being a fundal rupture, occurring spontaneously during *labor* at term, renders it unique. I can find no record of a similar case in obstetrical literature. Spontaneous rupture of the body or fundus of the uterus during *pregnancy*, from dancing, lifting, vomiting, fatigue, and as the result of disease, has frequently occurred, and many such cases are noted.

In that admirable work, *An American Text-Book of Obstetrics*, the author writes: "These (spontaneous) ruptures must always originate in the lower segment of the uterus." And Dorland, in his excellent *Manual of Obstetrics*, just published, says: "The site of the rupture varies, but is always low down in the lower uterine segment." This case should probably modify these statements in later editions of these books.

Should the reporting of this case show that spontaneous rupture of the uterus during labor at term may be caused by an abnormal condition of the organ, and may be located at the body or fundus of the uterus, the object of the writer will have been attained.

DISCUSSION.

Dr. Bedford Brown, of Alexandria (by invitation).—I desire to speak on this occasion of the action of ergot as a cause of rupture of the uterus, and I will cite a case in illustration of it. Some years ago I was called to see a woman in labor, of the mulatto race—a delicate, thin, rather emaciated, tuberculous woman. As I entered the room I found her in charge of a midwife. About two or three hours previously she had taken enormous doses of ergot, and when I entered the room she was in the midst of intense pain. On examination I found she was in labor, with facial presentation of the fetus, but the head seemed to be impacted in the pelvis very firmly. I had no more than barely touched the head of the fetus before it receded within the uterus entirely beyond my reach. Then, of course, I suspected that rupture of the uterus had taken place, and I found it was so. The fetus had ruptured the uterus and had escaped within the peritoneal cavity. The placenta remained in the uterus, and was finally discharged. But before I could accomplish anything the woman was dead. The walls of the uterus were probably one-eighth of an inch thick.

This case I simply cite as an illustration of the great danger of giving ergot in cases of labor where the head of the child is apparently obstructed.

Dr. R. W. Martin, of Lynchburg (by invitation).—Though I am not a member of your Association, I take pleasure in stating what has occurred to me during many years of practice in regard to this subject. Unfortunately, I did not get here in time to hear all of the paper; but there are other causes of rupture of the uterus besides the administration of ergot. There is usually in connection with rupture of the uterus a pathologic condition—namely, fatty degeneration of this organ. The violent pains, which may be increased, as Dr. Brown has stated, by the administration of ergot, will give rise to rupture, but the main point to be considered is fatty degeneration which has already taken place in the uterine walls. The walls of the uterus may be thin from various causes. There may be obstruction from the narrowing of the pelvis; there may be obstruction from want of dilatation of the mouth of the uterus when labor has been prolonged. The pains may be so violent that rupture will take place on account of the weakened condition of the uterine walls. Whenever this occurs, of course, there is only one recourse—that is, to deliver as soon as possible. Fatty degeneration, in my opinion, is the main cause of the rupture of the

uterus. Fortunately, in my own practice, I have had but one or two cases, consequently I can only speak with a limited experience on the subject.

Dr. Charles A. L. Reed, of Cincinnati.—In one of the early volumes of the Transactions of this Association I reported one or two cases of rupture of the uterus which occurred in my practice. In neither of these cases was the record complete, just as I believe the record of Dr. Hypes's case is not complete in all its particulars. From a very careful study of diseases peculiar to the placenta, I am convinced we find in that organ the initial condition which leads to the difficulties in the parenchyma of the uterus, resulting in rupture. Of course, I exclude those cases now in which rupture occurs as a result of the combined force of an obstructive and narrow pelvis and violent contractions on part of the uterus. In those cases the obstruction nearly always occurs at the point of impingement between the head and the os pubes—namely, at the ring of Bandl. I am convinced fatty degeneration occurs in the placenta with a relative degree of frequency, and that the same condition extends to the uterus. It would be an interesting fact, indeed, to determine in this case whether or not there was a fundal site to the placenta, and whether or not the fatty degeneration was not more or less restricted to the site of placental implantation. If that were true, it would throw some light upon the etiology and pathology of this condition. The two cases which I have reported, and it occurs to me I reported them to this Association, occurred in the relatively earlier years of my experience as an abdominal surgeon, and as a result I would treat them both differently at this time. I treated them both by closure of the incision with the Czerny-Lembert suture. One case recovered and the other died. I believe these cases of extensive mutilation of the uterus should be treated by extirpation, doing a Porro operation, or a complete hysterectomy, as we now do hysterectomy in certain cases of myomata, removing the entire body and cervix. I should now treat one of those cases if it occurred in my practice in that manner.

Dr. Hypes is to be congratulated for the opportunity of presenting this case to this Association, and this Association is likewise to be congraulated for having placed upon its records one of the most unique cases of rupture of the fundus. It is clearly a case of the uterus yielding to the expulsive efforts of the organ itself, and not as a result of the progressive attenuation of the walls of the uterus incident to the pressure of the head against the median zone of the corpus uteri as it impinges between the head and the os pubes.

I believe our knowledge of the pathology of this question is as yet

quite nebulous, and for my part I have never been able to encounter in the whole range of our literature an adequate explanation of this accident.

The *rôle* of ergot in producing this accident is pretty clearly defined. If ergot, as I believe it does, stimulates contraction of the involuntary fibres of the uterus, we can say it is an inadmissible drug in all cases in which there is an obstruction to the free delivery of the fœtus. The case is of value for precisely the points which the doctor has emphasized, and for presenting it to us I feel we are under obligation to him.

Dr. Walter P. Manton, of Detroit.—I never have had a case of rupture of the uterus in my own practice, but not long ago I was called to see a post-mortem on a woman who had died suddenly immediately following childbirth. After hearing the history of the case I told the doctor I thought he would find rupture of the uterus. The case was that of a woman who had borne several children, and previous to her last pregnancy she had suffered from endometritis and tubal troubles, for which her physician had treated her by electricity. Labor was very long and forceps were used. The position was a right occipito-anterior. The child was cyanosed when delivered, and the doctor asked her husband to hold the uterus while he was trying to resuscitate the child, which he did. He was so busy resuscitating the child that an hour elapsed before he gave up his attempt, and all that time the husband was holding on to the contracted womb. The doctor then said to the husband, "That will do," and the husband left the room. In ten minutes after that the woman was dead. The uterus immediately dilated, and the rent, which was at the cervico-vaginal junction of the right side, was sufficiently large to admit two or more fingers. The question in my mind is whether the previous electrical effects of the treatment which this woman had undergone might not have had something to do with the rupture. She had gone through several other deliveries safely. Her pelvis was roomy, and I believe the physician who delivered her was sufficiently skilful with instruments not to have produced rupture in that way.

Another case which I heard of occurred recently in the practice of a friend of mine in one of the interior towns of Michigan. He was called to see a German woman who was having terrific labor pains. Suddenly the child seemed to disappear from the uterine cavity. On making a vaginal examination the doctor found that the feet of the child were in the abdominal cavity. He had no instruments with him (it was in the country), and so he pulled the child through the rent in the uterine wall and delivered it in that way. The uterus contracted

well, and, strange to say, the woman lived some three or four days. I asked the doctor why, seeing that the woman was in a fair condition, he did not attempt to do something for her? I told him that if I had been there and had had nothing but a jack-knife, a cambric needle, and some thread, I would have made an effort to sew up the laceration or to have removed the uterus.

I think that this case is one which illustrates the necessity of prompt action in all instances of the kind, and it seems to me that the physician should not wait always to be provided with his regular paraphernalia, but should take whatever may be at hand and not let a woman die because of lack of time to procure the proper instruments.

Dr. James F. Baldwin, of Columbus.—My experience is limited to two cases of rupture of the uterus; one the doctor has alluded to, and one I saw under similar circumstances to those mentioned by Dr. Manton. I was in the office of a prominent surgeon of my city when he told me of a case of labor that had presented peculiar features, among them being that, when he examined the woman at one time, labor was progressing all right, but that when he examined her a little later the child had receded. I said that that looked like a case of rupture of the uterus. He thought not. The words were hardly out of his mouth when the attending physician came to the office door and wished him to go at once to see the patient, as she was not doing well. I was invited to the post-mortem the next day. The doctor learned on reaching the house that my surmise was correct, and that there was a rupture of the uterus, with the escape of the child into the abdominal cavity. He introduced his hand, caught the child by the feet, and delivered it through the natural passages. That case occurred a good many years ago, before abdominal surgeons were doing much in that line. The autopsy in that case revealed a small fibroid in the anterior uterine wall just above the junction of the bladder, and it was at that point that rupture took place. The presence of fibroids is put down in our text-books as one of the causes of uterine rupture.

The second case occurred in a woman whom I was called to deliver. She had been in labor a week, under the care of a man who pretended, among the ignorant English in our city, to be an ex-Crimean surgeon. He attended her for several days, and then sent for consultation in the person of a man about as ignorant as himself, a laughing-stock of the profession, and after two or three days more—making a week in all—an eminent surgeon was sent for, and I was the fourth physician called into the case. I found that the child was dead and had been dead for several days. It was rotten. It had a hole in its head at

the anterior part, where the first physician had bored his finger. A craniotomy had been commenced. The head was away down in the vagina, and I completed the craniotomy by taking away part of the bones to reduce the size of the head. The labor pains had long since ceased. I was able to pass my hand in, pulling the scalp down over the remaining ramus bones, and with the assistance of the surgeon who was pressing upon the abdomen, giving a *vis a tergo*, I was able to deliver the child. As its shoulders came out of the womb I noticed a rather sudden giving way. As soon as the child was delivered, my hands being covered with slime and other *débris*, I passed my hand at once up into the uterus to deliver the after-birth and whatever *débris* there might be there. This was twenty years ago. We had no microbes then. As I passed my hand forward to scoop out the contents of the womb I was horrified to find it in the abdominal cavity. I was grasping the contracting womb. I withdrew my hand, then passed it up into the cavity of the womb, delivered the after-birth, clots, and so on. I at once explained what had occurred. As the prognosis was regarded as hopeless, the attending physician was directed to give the patient all the morphine she wanted to keep her comfortable and to produce euthanasia, and we took our departure. About a year afterward she walked into my office, much to my surprise, to see me in regard to why she could not hold her water. I found a vesico-utero-vaginal fistula. She had recovered from her confinement without trouble, and now came for treatment of this condition. I arranged for an operation, but, calling on her a day or two before the time set for the operation, she remarked that she was not passing much urine. I had her lie down, and secured in the top of the vagina a teaspoonful of urine. I took that home, tested it, and indefinitely postponed the operation, for the reason that the urine contained a considerable amount of albumin. This was the last urine she ever passed. On the day set for the operation we held an autopsy, and found death due to kidney disease. The uterus showed that the rent had occurred in the posterior wall; the rectum had dropped forward, had become adherent at that point, and nature had accomplished what I am very certain we would not have accomplished if we had done an abdominal section. The case is perhaps unique as showing what some women will undergo and not die.

Dr. W. B. Dorsett, of St. Louis.—This case is of particular interest on account of the location of the rent. Most of these tears occur anteriorly instead of posteriorly, as stated by Dr. Baldwin, and are due to the anatomical construction of the muscular fibres. The longitudinal and transverse fibres of the neck of the womb coming together at that point, the organ is naturally very much weakened. The fibres

Tear at juncture of body with neck anteriorly.

on the fundus of the uterus are continuous with the Fallopian tubes, and as they are matted together, forming a meshwork on the fundus, it makes it much stronger there than anywhere else.

I have seen two cases of rupture of the uterus, which were operated on some two years ago. The uterine rupture was due to contraction of the uterus, but no ergot had been given. One woman had been in labor seventy-two hours, and efforts to deliver a hydrocephalic child were futile. The forceps was applied a number of times. I was called in to produce podalic version and to see if I could not deliver the child. Before preparations were made to place the woman upon the table I decided to examine her, and noticed the general contour of the abdomen had changed materially; that the uterine tumor had become elongated; that the fundus of the uterus was behind the ensiform cartilage, and I called the attention of the house-surgeon to this change in the appearance of the abdomen, stating that I believed we had a rupture of the uterus and that an operation would be necessary. The abdomen was opened, and the right arm up to the shoulder of the child was found to be out of the uterus. The tear was transverse and in front, just at the junction of the bladder and the uterus. It was impossible to deliver the child through the small opening, consequently another cut was made longitudinally and the child extracted. The child was dead and had been for some time prior to its extraction.

The measurement of the child's head was nineteen and one-quarter inches in circumference just above the ears; the bones of the head were soft, and the rupture was due not to the use of forceps, but to the length of time the woman was in labor, together with the violent uterine contractions. No ergot had been given.

The other case I have heretofore reported. It was one in which I was called to the house and the woman was said to be dying. In this case I found the child's foot and leg above the knee in the abdominal cavity. The rupture in this case was also anteriorly and low down.

Dr. Hypes.—What presentation did you have?

Dr. Dorsett.—It was a breech presentation. The first was a vertex.

Dr. John M. Duff, of Pittsburg.—I had not thought of speaking upon this subject. I have several cases, if I had the data, that I would like to report in this connection. I do not think rupture of the uterus is of very frequent occurrence, although it may be more frequent than we have any idea of.

About eight years ago I was sent for one night by a gentleman to attend his wife, a young lady with whom I had been acquainted for several years; in fact, I had known her from girlhood, and knew that she belonged to a family who were neurotic and tubercular. Her father

had cancer of the stomach, as I remember it now, and she had one or two brothers and sisters who died of tuberculosis. I went with him immediately, about a mile and a half. He said he had not left anybody with his wife when he started, and he came after me first. I found her sitting in a rocking-chair, dead. I took hold of her wrist, found that she was pulseless, put my ear to her abdomen, and could not hear the fetal sound. This was the only case of rupture of the fundus of the uterus I have ever seen. I have reported this case heretofore, but do not remember the exact date.

My father told me that the first year he practised medicine—nearly sixty years ago—he was called to see a case with his preceptor in which they found almost the same conditions, the rupture being near the fundus.

Last winter, when I went to lecture one morning at the college, the janitor told me that Professor Lange had sent a specimen to me. I asked him what it was, and he said he did not know. As near as I remember the words, Professor Lange said, "Here is a specimen of rupture of the uterus for you to show the class." The history of the case was that a physician had been in attendance, had used forceps for several hours, and failed to deliver the child. The woman was sent to the Western Pennsylvania Hospital, where Dr. Lange applied forceps and delivered. The woman died within a short time afterward. At the point of rupture, near the corporo-cervical junction, I found the shape of the forceps in the tear. I do not think Dr. Lange was guilty of doing this, but the physician who had preceded him had used the forceps for a long time and had pushed the instrument through the uterus.

I have seen two other cases which now occur to my mind, in which there was evidently rupture of the uterus. In one, unfortunately, I could not get a post-mortem examination. In the other I was called hurriedly about three years ago. I have not heretofore reported this case, though have often thought of doing so. But I could not get the exact data, the previous history, etc. I had just left my office when a gentleman came and asked me if I would be kind enough to see a poor woman at the head of 20th Street. I asked him what was wrong, and he said she had been moaning for a good while, and that her brother and sister had left her. I started up the street, but before I had gone very far I met one of the students of the college and asked him to accompany me. As I entered the door I thought I saw a woman breathing. The floor was so rickety that our steps vibrated her body. I found her pulseless, but on account of having seen this motion I thought I would try to save the baby. I took out a bis-

toury, cut into the uterus, and found a rupture of this organ with the head, shoulders, and one arm of the child outside the uterus. The woman was dead. The baby was dead. I want to say that I have given the facts in these cases to the best of my memory.

The probabilities are that we have rupture of the uterus more frequently than we have hitherto been led to suppose.

Dr. Hypes.—Please locate the rupture. Was it at the lower zone of the uterus?

Dr. Duff.—It was at the upper zone of the uterus. It was a breech presentation. The woman had been in labor for a good while, was poor, and nobody paid any attention to her, thinking probably she would get through all right. The rent was at the left side of the fundus.

Just one more point with regard to rupture of the uterus, in which I had not the advantage of holding a post-mortem myself, but the gentleman who conducted it reported to me that there was a rupture of the uterus. It was a shoulder presentation. The lady was the wife of a coal miner. One physician had been in attendance upon her for some eighteen hours, at the end of which time a second one was called, who rode into the city some ten or twelve miles, reached my place at five o'clock in the morning, and asked me to go out and see her. I went out, delivered the woman without any trouble. I reached up, got hold of the foot and delivered. I came home, and did not think anything more about the case. I subsequently learned that the woman died, and at the post-mortem a rupture was found just at the corporo-cervical junction. It was not large, but it was sufficient to allow the fluids to escape into the abdominal cavity.

Dr. Carstens.—I would ask Dr. Duff whether he turned in the last case?

Dr. Duff.—Yes. I gave the woman an anesthetic and turned. It was a case of neglected shoulder presentation.

Dr. A. H. Meisenbach, of St. Louis, Mo. (by invitation).—I hope I may be pardoned for trespassing upon the time of this Association, but I happen to be the medium that makes it possible for the presentation of the specimen by Dr. Hypes. I was called on the 17th of September last by Dr. Wichmann to come immediately to a case and be prepared to operate. This was four o'clock in the afternoon. I took my bag with me, and, reaching the house twenty minutes after four, I found the woman Dr. Hypes had described *in articulo mortis*. She was in the last stages of dissolution. The doctor told me that he thought he had to deal with rupture of the uterus. I made a hurried examination of the vagina, and found a patulous os through which could be introduced two fingers. The uterus was empty, and I could

distinctly feel the child in a transverse position within the abdominal cavity. We thought, upon auscultation of the abdomen, that there was a slight fetal pulsation, and I suggested to the doctor and to the husband, who were standing by, that possibly it might be worth while to do a laparatomy, and attempt to save the child. The husband agreeing, I opened the abdomen, going through the abdominal walls with one incision. On cutting through the peritoneum an immense amount of clotted blood escaped, and the child was found free in the abdominal cavity. I had no trouble in taking hold of the feet and extracting the child; severing the cord, I passed the child to the assistant, and attempted to resuscitate it, but failed to bring the child to life. The extravasation of blood in the abdominal cavity was extreme. I suggested to the doctor that, during the time attempts were being made by an assistant to resuscitate the child, we take out the uterus, which we did, and secured the specimen which Dr. Hypes has presented to you. At the time of taking the specimen from the abdominal cavity its condition was somewhat different than you see it now. The tear in the uterus was through the fundus, extending toward the cervix. At the placental insertion the walls of the uterus were thick. At the site of rupture the walls were thin. On placing the specimen in formol solution, I found it contracted considerably and hardened, which those who have had any experience with the use of formol in the preparation of pathological specimens will know has the effect of producing.

This is the first case of rupture of the uterus that has come within my experience of some twenty years in both private and hospital practice.

A few days before leaving to attend this meeting, among a package of books I received from Berlin was a brochure by Alfred Koblanck, first assistant to the Kaiser-Koenigliche Frauen Klinik, Berlin, Germany, giving some interesting points in regard to eighty cases of rupture of the uterus which he has analyzed. I find the following statements, as far as the etiology of rupture of the uterus is concerned. He divides these ruptures into spontaneous and violent. The number of spontaneous ruptures produced by narrow pelves amounted to eight; transverse positions, seven; other positions, four; hydrocephalus, four; disproportion in the size of the parts presenting within the tract and of the parts of the mother, three; the effects of sequelæ, one; endometritis, myomata, and predisposition, four, with an interrogation point behind them. Of those due to violent rupture he relegates five to trauma, twenty-nine to version or turning, one to Hoffmeyer's procedure, ten to forceps, one to decapitation, and one complicated with

myoma, so that the majority of cases of rupture of the uterus are due to interference, especially manual version.

As far as the pathological changes are concerned within the uterine wall, Koblanck has found that there is nothing positively definite. The microscopical examination of these cases showed fatty degeneration, yet Koblanck makes the assertion in the examinations he has made that he has failed to detect positive indications of fatty degeneration of the uterine tissue; the same of hyperplasia of the uterine wall. He found in one case that there were intermuscular spaces in the uterine wall—namely, that at the fundus of the uterus, upon placing his hand within the uterine cavity and attempting to extract the placenta, he found that he could feel the end of his finger through the abdominal wall, and yet not penetrate the walls of the uterus; and that after the delivery of the placenta, a few days after the delivery of the child, he found these spaces had been obliterated. So that, as far as the etiology and pathology are concerned, in rupture of the uterus they are at this time very uncertain, because the pathologic findings have not been definite.

A great many causes have been given of rupture of the uterus, besides those of hyperplasia and fatty degeneration—namely, those of syphilis, debility, etc., yet none of them have been positively proven. The interesting point to the surgeon is the mode of dealing with these cases when they are presented to him. Where we have small tears there is no question but that these are the cases where recovery takes place, but where we have an excessive tear in the uterine wall, and the contents of the uterus, including the fetus and secundines, escape into the abdominal cavity, we have a fertile field for sepsis, and these cases become septic. When the woman dies immediately after rupture of the uterus, then hemorrhage is the cause of death. The mortality as illustrated by the table of Koblanck is 73 per cent. His contribution is the most recent to the literature of rupture of the uterus, and it is interesing in that it gives recent methods in dealing with this condition.

The way to deal with a rupture of the uterus is by either one of two procedures—namely, tampon the uterus after clearing it out with gauze tampon, or else resort to section and suture, or a Porro operation. The conditions met with must be the guide for the particular operation. I do not believe any surgeon would hesitate, on being confronted with a case of uterine rupture, if the strength of the woman was sufficient, to open the abdomen, extract the child, either sew up the rent, or do a Porro operation.

Dr. Rufus B. Hall, of Cincinnati.—I desire to mention a case

that has not heretofore been recorded. About five years ago I was asked by a young physician in Cincinnati to see the case of a poor woman. He came to my office about breakfast time, related the history of the case, and stated that the woman had been in labor some hours. He thought there was a fibroid tumor of the uterus. He told me to eat my breakfast; that there was no particular hurry. I said we would go together and see her. An hour after that I went to the doctor's office, then to the woman's house, and found her dead with a rupture of the uterus, and the baby in the abdominal cavity. We were permitted to examine the patient somewhat, when a fibroid was found in the lower segment of the uterus, and the child crosswise in the abdomen. We were told that she had an intense pain, then something broke loose, she fainted, and had not been dead more than three or four minutes when we had entered the house. This is the only case of rupture of the uterus that has ever come under my observation. We wanted to open the abdomen to see if we could extract the child alive, but were refused the privilege.

Dr. Joseph Hoffman, of Philadelphia.—I have had three cases of rupture of the uterus, and, unlike Dr. Duff, I turned and ruptured the uterus. And there is the point. Turning is not half as easy and simple as the books make it. It is a dangerous procedure under certain conditions, particularly in the case of a big child and extreme contraction of the uterus.

The second case of rupture that I have knowledge of was one where a midwife had given ergot in connection with the use of forceps used by two other physicians. I was called to deliver the child. They had failed, and in introducing my hand to make version I pulled down the intestines. The location of this rupture is interesting in that it was in the posterior segment of the uterus, about half an inch above the ring of Bandl.

A third case of rupture of the uterus is one that occurred just a few weeks ago in the wife of a physician in Philadelphia. The woman had not gone into labor. The rupture occurred in the extreme fundus of the uterus. The woman had never had labor pains. The cause of the rupture nobody knows.

I was pleased with Dr. Meisenbach's discussion, and I like his summing up, as he covered the ground so well. There are causes which we can put down of rupture of the uterus, and we know pretty well that the subject and objective causes are extreme labor pains. Then we have objective causes on the outside. We have ergot and forceps, version, and pathological conditions. The point which most concerns us from a practical standpoint is to recognize once and for all that

version is the thing that the doctor is to guard against. So far as treatment is concerned, we know what that is. There is no use of discussing causes outside of our own personality by saying that something we do may cause rupture of the uterus. That is a thing we have got to avoid. If we produce a rupture, the main thing is how to get out of it by surgical procedure.

Dr. James McFadden Gaston, of Atlanta.—I did not expect to say anything on this subject, but after the remarks of Dr. Hoffman I feel called upon to make a contribution to this discussion of a negative character. Out of a large number of surgical cases I have never met with one of rupture of the uterus. I have resorted to version repeatedly, and I have given ergot repeatedly in the early period of my practice in the country. It was my habit to use ergot in almost every case of tardy labor, to save time, and I have never seen any results that were unfavorable from its use.

It seems to me we must account for these cases of rupture of the uterus upon the basis of pathological conditions. I do not think our manipulations are responsible usually for such results. My observation in this line has been somewhat extensive. I have had my fair share of obstetric practice during my whole professional career, and I must say that I have never met with a case of rupture of the uterus.

Dr. Duff.—I would ask Dr. Gaston a question in connection with the use of ergot, as to whether he frequently had stillborn children in his cases?

Dr. Gaston.—No; but I have had in some twenty odd cases hourglass contraction. I am sorry to say that I have had lacerations of the perineum somewhat frequently, but I have repaired them promptly by operation.

Dr. Hypes (closing the discussion).—I am glad the report of my case has elicited such an interesting discussion. I have very little to say in addition to what I said in the paper. However, I desire to answer one or two points that were bought out. Dr. Meisenbach should correct his statement that the rupture occurred through the placenta. The uterus did not rupture through the placenta, because I removed the placenta myself from the anterior and lateral portion of the womb, and the rupture was through the thin fundus above the placenta. The thickened portion of the uterus could be felt by any of you where it was attached.

In answer to the remarks of Dr. Reed, I would say that there is a good deal of foundation for what he says, that disease of the placenta tends to produce disease of the uterine walls. We have that exhibited in many cases. Cases are reported where rupture of the uterus occurs

during pregnancy, and there is a diseased condition of the uterine walls in and about the insertion of the placenta. Quite a number of such cases have occurred. We have had cases of hydatid degeneration of the placenta, of cystic degeneration of the placenta, and this cystic degeneration has extended to the walls of the uteus, and has even gone through them, causing a spontaneous rupture of the uterus at this point. These cases, however, all occur during pregnancy and not during labor. I want to make that distinction in this case.

With reference to the remarks of Dr. Duff, I am glad to know that he knows of such cases where rupture has occurred through the fundus, because the text-books are misleading in that respect, and every picture I have seen has represented rupture of the uterus either at the neck or at the lower zone of the body of the uterus. If a rupture has occurred, it is important to know whether the labor occurred at term, or whether it was premature, and whether the child's head ruptured the fundus of the uterus.

In regard to the causes, I will not spend time in discussing them, because they are quite well known. However, as a scientific body of men, devoting time especially to obstetrics and gynecology, I think some few statements should be made. As a general thing, the majority of these cases occur through interference on the part of the physician. A large number of them are reported as a result of version. Still other cases are reported in which uterine rupture has occurred from the use of instruments, both the hand and forceps being forced through the body of the organ. This being the case, it indicates how dangerous it is in certain conditions for instruments to be used and operations to be made.

The points made by Boswell, in his study of the changes of the uterus, should be known and observed by every obstetrician and consulting surgeon, and that is not to attempt the use of instruments violently, and especially version, where you have this formation of the Bandl ring and the creeping up of this ring along the body of the uterus toward the fundus. Sometimes it is quite plain. I have noticed it in long, tedious labors two or three times, where this ring could be traced as high as the umbilicus. With this condition of the uterus it is most dangerous for the consultant to interfere either by version or with instruments.

As to the after-treament, Dr. Meisenbach has taken away all of my speech, and has stated the matter very plainly with this exception, that we must remember some of the ruptures are complete and others incomplete. Where the rupture is incomplete, and the amniotic fluid and the contents of the uterus have not escaped into the cavity of the

abdomen, it is unnecessary to open the abdomen or to perform any operation of that kind. Simply packing the uterus with sterilized gauze and letting the woman alone, with the application of a tight bandage, is probably the best treatment. Where, however, there is a large rupture, with escape of fluids into the cavity of the abdomen, then laparatomy should be performed and the uterus repaired if its walls can be readily closed. If the walls are ragged or lacerated, so that nice, neat union cannot be made, then a Porro operation ought to be resorted to.

Lastly, with reference to the use of ergot, I only resort to it after the uterus has been emptied of the fetus and the placenta. I oppose its use in cases of labor.

PORRO'S OPERATION, AT OR NEAR THE FIFTH MONTH, FOR SMALL FIBROID OF THE CERVIX, ACCOMPANIED BY HYDRAMNIOS AND TOTAL RETENTION OF URINE.

By EDWIN RICKETTS, M.D.,
CINCINNATI.

I DESIRE, in as few words as practicable, to present for your consideration the following case with a few brief comments :

Mrs. M., white, aged twenty-six years, of short stature, mother of two children of six and three years of age respectively, with an abortion at eight weeks early in 1895; no specific history, and a patient of Drs. J. B. and C. M. Warwick, of Lucasville, Ohio. Drs. Warwick first saw her on January 10, 1896, finding that she menstruated last in the first week of November, 1895. They also found the uterus enlarged and firmly bound down in the pelvis, especially to the left, and extremely tender to pressure. There was uterine hemorrhage in March, 1896, and again in the following month, lasting for twenty-four hours. Her labors and abortion were prolonged and severe and accompanied by great suffering, while dilatation in all instances was accomplished with difficulty. From January 10, 1896, she had no desire to urinate, nor could she void a drop of urine without the aid of the catheter.

On February 23, 1896, she had severe labor pains lasting thirty-six hours and accompanied by slight hemorrhage; the right portion of the cervix being soft and the left hard, which condition was also present at the time of the operation.

During April and until May 22d, date of operation, she was very tender over the lower part of the abdomen, and at times had a temperature above 100°, with a pulse running from 90 to 100. I saw her in consultation at her home April 8, 1896, when for the first time motion of the fetus was barely perceptible.

On May 22d, Drs. Warwick, Kline, Sellards, and myself found her abdomen larger than it should be at full term, which was due to the hydramnios present. There was no difficulty in moving the fetus freely in the abdominal cavity, so thin was the uterine wall. It was decided unwise to delay surgical interference, and we therefore proceeded to perform a Porro under as strict asepsis as the circumstances would permit. After the abdomen was opened I passed my hand down into the pelvis, breaking up the pelvic adhesions. Upon the delivery of the fundus of the impregnated uterus through the abdominal incision, a rubber ligature was thrown around it low down and tight enough to control any hemorrhage which might occur. The fluid which escaped upon opening the uterus surpassed in amount any that I have seen delivered *per viam naturalem*.

After carefully sponging the parts the wire was tightly adjusted below the rubber ligature by means of the Koeberle clamp and the rubber ligature then removed. After the delivery of the placenta, which was not difficult, the fundus was amputated, leaving the ovaries and tubes intact. The abdominal wound was closed with silkworm-gut sutures, without stitching any tissue to the stump below the wire. No drainage-tube was used. The extraperitoneal part of the stump was dressed with gauze moistened in glycerin and tincture of iron, the stump being held up by the double-hooded pin of Tait. The placenta and fetus were small for near five months' gestation, and the cord was tied in almost a hard knot—harder than any I have seen. The fetus had marked cyanosis, and gasped but once. Recovery of the mother was satisfactory.

Of near four hundred Porro's, all told, Dr. Robert P. Harris gives 27.75 per cent. of mothers and 18.25 per cent. of children lost, the operations being performed in the following countries: Germany, Austria, England, Mexico, Switzerland, Scotland, Canada, United States, France, Egypt, Madeira, Australia, Japan, Sweden, Holland, India, and Belgium. Dr. Harris further states that in the first forty cases twenty-one were lost.

The principal and unusual feautres for consideration in this case are that there was no pain or desire to urinate, even at times when the bladder was abnormally distended, and the presence of hydramnios with so small a fibroid—not as large as a hulled walnut.

I find that this is the first reported Porro for a small fibroid of the cervix accompanied by hydramnios and loss of desire and ability to urinate.

Herman reports, July 24, 1894, in the London *Lancet*, a Cesarean section for fibroid tumor causing retention of urine and obstruction of labor; hydramnios was also present; mother and child lost.

DISCUSSION.

Dr. W. G. Macdonald, of Albany.—The operation of Porro presents a great many advantages. I have had a little experience in doing the operation. I have operated on three cases within the last four years. In a case somewhat similar to the one reported, a large fibroid tumor blocked the pelvis, and it was of much interest in that no knowledge of the condition was known until the time of delivery.

The patient was attended some thirty-six hours by her own physician, who at that time discovered that there was something apparently wrong. A consultation was called, chloroform was given, and a careful examination made, when a fibroid as large as a good-sized hat was found. We got the patient out of bed, she rode twelve miles in a wagon, and then twenty miles by railroad. I operated upon her the following morning, and after making a careful examination, I found it imposible to deliver her naturally. The child was delivered dead. We pulled up the uterus, and with it the fibroid, which absolutely filled the pelvis.

In the treatment of the pedicle in this case I did the same thing that Dr. Ricketts did—namely, put on a clamp. You know that we have good-sized vessels here, and speaking for myself, I can put on a clamp in a case of hysterectomy, and the wound will heal up with much less shock than when I treat the pedicle intraperitoneally.

The condition of the kidneys in Dr. Ricketts's case is interesting, but is it not possible that the obstruction may have been brought about by pressure on the ureters? In all cases of cancer of the uterus that I have seen this is largely the case, and Dr. Welch tells me that the results of his observations in the pathological laboratory of Johns Hopkins University point to the fact that hydronephrosis exists in all of these cases.

In one case on which I operated for cancer of the cervix I could pass my finger into the mass, but it was as hard as stone. The probabilities of delivering a living child were exceedingly remote; but nev-

ertheless, the child lived in that case. The operation was done in a tenement-house, at midnight, and I simply followed the same procedure, removing the uterus because I could do it quickly, and I put on a clamp. There was no prospect of the woman's recovery from the cancerous disease without cutting off both ureters, and that seemed hardly desirable. The child is living. The mother lived but three or four days after the operation.

A third case was one in which, under the most favorable circumstances, I should certainly do a Cesarean section. The condition was one of contacted pelvis, the conjugate being some two and five-eighths inches, as was afteward determined. On account of lack of assistance, I simply did a Porro operation. My impression is that I could do a Porro operation as safely as I can do an improved Cesarean section. Others may have a different experience in that direction. It is a simple operation; it is really easier than a hysterectomy in my experience, and patients do equally as well afterward. I can see no reason why we should simply sew up the uterus, allow the woman to get in precisely the same condition again, and have to undergo the second Cesarean section. We certainly ought to do something besides incising the uterus, removing the child, and sewing the uterus up again. We ought to remove the appendages, if not the uterus, for the mortality following Porro operations, if followed out, is not greater than that of Cesarean section. In many instances we have a practical way out of a very serious difficulty. Where we have fibroma or cancer, there is no doubt of what we should do. We are to operate, and ought to remove the uterus, but in other conditions it is a matter of election. If Cesarean section is indicated, it is a question of doubt in my mind whether, in those cases, it is not about as well to do a Porro operation at the same time.

Dr. Wm. H. Myers, of Fort Wayne.—I have been very much interested in Dr. Ricketts's paper. I have had one Porro operation in which I resorted to the same method—namely, using the ligature, afterward the serre-nœud, of which the doctor speaks. And it is a singular fact that I performed this operation in a hovel. I was called in haste, without very much assistance, and yet after the operation was done the woman made a splendid recovery, and the child is living.

Dr. J. Henry Carstens, of Detroit.—If I understood Dr. Ricketts correctly, his case was one of hydramnios with a small fibroid.

Dr. Ricketts.—Yes, sir.

Dr. Carstens.—The question arises in my mind whether it is the right kind of a case for a Porro operation, and whether it is justifiable. Personally, I have grave doubts about it. I do not think we ought to

let it go out from this Association that a Porro operation is the right procedure for a common everyday case of hydramnios. We can open the uterus, let out the water, and save the woman without subjecting her to a Porro, and then if there be a fibroid tumor or tumors, we can remove them later, when the tissues and the woman are in proper condition. I think we sometimes manifest symptoms of *furor operativus*, and we had better draw the line somewhere. The line should be drawn in case of common everyday hydramnios. In these cases we can introduce our finger into the uterus, rupture the membrane, and let out the water very readily.

Dr. I. S. Stone, of Washington, D. C.—I told Dr. Ricketts that I was going to say something in opposition to the Porro operation for the condition he describes. I would like very much to discuss the propriety of this operation in certain conditions, but I respect Dr. Ricketts too much to differ from him. I would do, however, as Dr. Carstens recommends—namely, empty the uterus unless the fibroid was larger than in this case.

Dr. John M. Duff, of Pittsburg.—I think this is a very important matter, and one in which we should endeavor to form a positive opinion as far as we can. We all know how difficult it is to determine exactly what to do in certain cases. I have done symphyseotomy. I believe my case was the ninth one reported in this country. I do not know whether I did right at the time in performing this operation, or not, but I feel confident I did the best for the woman, as was exemplified by an excellent result. It is difficult to tell sometimes whether a Porro operation is better than a symphyseotomy. My assistant brought a case into the hospital in Pittsburg which had been under the care of a midwife for thirty-six hours. He had been called in, and used forceps, but failed to deliver. I told him to perform a Porro operation, and I would help him. The woman had been in labor forty hours, and I regret I have not the measurements of the head and pelvis at the present time. The child was dead at the time. We could not get any fetal heart-sounds. A Porro operation was performed, and the woman never had a temperature above 99½°. She made an excellent recovery. She went home in about three weeks perfectly well. My experience with symphyseotomy is not any better than that; in fact, it is not as good. There is some doubt as to the union of the symphysis pubis, and there is great danger of injuring the bladder and soft parts of the pelvis. I think it is getting to be a question for us to decide whether to resort to symphyseotomy or to the Porro operation. As I said last night, in the remarks I made on another subject, we should not be ashamed

to stand up and advocate exactly what we have been doing. We are here to find out the opinions of others, and what is best to do.

Dr. H. W. Longyear, of Detroit.—It seems to me that if we attempt to criticise Dr. Ricketts's method of treating this case it should be entirely upon the basis of the dilatability of the cervical canal. If the cervical canal was in such shape that he could have dilated it and extracted the fetus as well as let the water out, there is no question whatever but what that should have been done instead of resorting to a Porro operation. On the other hand, if he could not have done that he was justified in doing a Porro operation.

Dr. Albert Goldspohn, of Chicago.—I agree with what Dr. Ricketts has said. I can readily imagine conditions where the uterus is so greatly distended that the cervix will be drawn high up, displaced anteriorly or laterally, so that cervical dilatation is quite impossible.

If any comparisons between symphyseotomy and Porro's operation are in order, I will say that symphyseotomy will save a woman's life occasionally when a Porro operation could not be done. I am satisfied that in one case I saved a woman's life, and also the life of the child, by doing a symphyseotomy. The woman had been in labor seventy-two hours Forceps was applied five times. She had been anesthetized three times. She was in a very extreme condition. She had lateral and antero-posterior curvature of the spine. The conjugate diameter of the pelvis was 7 c.m. She had a temperature of 102° and pulse of 140. I was called at three o'clock in the morning to see the case. The soft parts were extremely swollen and out of all proportion to the normal anatomy of the parts, yet I delivered the child by that method, and the woman recovered. One difficulty in the procedure was to get the uterus to contract after it was emptied, to stop hemorrhage. Everything that has been suggested to control uterine hemorrhage was tried and failed, until I used a strong interrupted current with one electrode in the uterus and the other on the abdomen.

Dr. J. W. Long, of Richmond.—I do not think we should condemn the operation as Dr. Ricketts applied it to the condition he speaks of. I desire to place on record in connection with his paper a Porro operation which I did on December 26, 1893. The operation was done in a negro cabin in North Carolina. The woman was three months pregnant, and had five or six fibroid tumors which were so situated as to fill the pelvis, making it impossible to effect delivery of the child in the natural way. I did an operation, making a supra-vaginal section, stitched the pedicle, dropped it, and closed the abdominal wound without drainage. The woman made a splendid recovery, and did not have

either a rise of temperature or of pulse after the operation. I believe this the first operation for this particular condition and by this method done in America.

Dr. James F. Baldwin, of Columbus.—Dr. Ricketts is so well able to defend himself that I do not think it is neecessary for me to take his part. I wish to report, however, a case upon which I did a Porro operation, with a few brief observations. I operated some seven years ago on a rhachitic dwarf, at full term, about two o'clock in the morning, in a cellar—a little worse, I should judge, than the negro cabin described by Dr. Long. The operation was exceedingly easy, as all will admit who have made it, and the patient made an uninterrupted recovery. Dr. Harris, of Philadelphia, said that it was the ninth operation in the United States, the third successful one, and the first one done in Ohio. Some months thereafter a hernia developed, and now the patient has a hernial protrusion the size of my fist. It annoys her very much, but she declines to have an operation done for it. This case occurred in Columbus.

A few months ago I was called to Jackson County, Ohio, to see a woman who when three months pregnant had aborted. The secundines remained. There was a large fibroid in the anterior wall of the uterus, and the cavity of the uterus was beyond the reach of the finger. Three days thereafter, as the woman was still bleeding and her friends were getting anxious, I was sent for. Nature seemed making no effort to expel the secundines, and they were beyond reach. As her condition was very good, I operated by my usual method of making supra-vaginal hysterectomy. Her temperature and pulse never went above normal, and she made a good recovery.

I think a Porro operation, where the pedicle is fastened in the lower angle of the incision, is the operation of emergency, an operation which any country physician with a reasonable amount of skill should be able to perform. It is an operation that a surgeon would perform if his patient were in a desperate condition, particularly if called upon to operate in the night. It is not a desirable operation in the hands of a surgeon if the woman is in good condition. Ordinarily I would prefer a supra-vaginal hysterectomy, closing the abdomen in the usual way. I think the results would be better. If the woman is in condition to bear children afterward, a modified Cesarean section should be made instead of a Porro, but I think the patient's own views should be taken on this subject. We know women have been delivered twice, or even three times, by Cesarean section If we do a Cesarean section (Sänger's operation) we should complete it by removing the appendages,

so that the woman will not be subjected to the risk a second time, unless requested by her to do otherwise.

Dr. Joseph Hoffman, of Philadelphia.—In reference to the removal of a fibroid of the cervix, we have to remember that when we have a case of difficult labor, where the impingement of the head on the cervix is great, or where the cervix is injured extensively by instruments, we may have subsequently stenosis of the os, which renders delivery absolutely impossible. Dr. Price had a case in Richmond where he was obliged to make a hole to get the child out. The woman died of sepsis, because she had been in labor for sixty hours. If we have a fibroid in the cervix, the removal of it may do such damage to the cervix as to cause stenosis of the os, and in subsequent pregnancy would endanger the woman's life more than any operation possible for the entire ablation of the uterus. I know of one case in Philadelphia which has served as a sort of living manikin. The woman was delivered once of a living child by forceps. She had a contracted pelvis, went into one of the hospitals there, and a Cesarean section was performed, the child living. She went out of the hospital, and in due season became pregnant, again entered the hospital, and was prematurely delivered of a living child. She left the hospital again, and in the course of time came back, and had another Cesarean section done, child living. She left the institution, again became pregnant, came back to the same hospital, and at that time symphyseotomy had become the rage, and this operation was performed. The woman ought to have had a Porro operation done in the first place. What is the use of sentiment if women are to be kept for operation. Let us get animals. Let us do surgery that saves.

The President.—I desire to say that the patient referred to by Dr. Hoffman had another operation done for a metro-abdominal fistula, and in the next labor the opening through the anterior abdominal wall was enlarged, and the delivery took place through it. This woman should have had a Porro in the first place. The physician who took charge of her in the last delivery enlarged the metro-abdominal fistula and delivered her, recording it as a Cesarean section.

Some one in the discussion said that the question of the character of the operation should be decided by the patient. Surely none of you will disagree on that point. It is always the duty of an intelligent patient to decide the character of the operation, but cases present themselves where this cannot always be done.

I have done seven Porros, five for fibroid tumors, and two for deformities. We have no right to criticise Dr. Ricketts and his judgment,

as his experience is large and varied. The natural history of fibroids and their behavior ought to be sufficient to guide the surgeon as to what is the best course to pursue in a given case. It is my impression that it was his object to relieve the woman of her burden. If so, his procedure was correct, and also his method was extra-peritoneally—the Koeberle operation. At present we have a modified Porro operation, and it affords us an opportunity to say something regarding it. Recent operations by dropping the pedicle have given us an enormous mortality. I will cite one case that occurred recently in Philadelphia in the practice of a hospital obstetrician there. A premeditated and modified Porro operation was performed, and resulted in death from virulent sepsis. This operation was done by the drop pedicle or amputation method. It is painful and distressing to anyone who is doing abdominal surgery to read about such a case. The young woman was perfectly healthy; there was ample time for preparation and consideration of the proper method to be carried out.

There is a tendency to criticise the Koeberle or the extra-peritoneal methods, and as far as I am personally and financially concerned, I rather welcome such criticism, because it does me good. It is to me an ideal procedure. You remove the tumor from the healthy peritoneal cavity and leave nothing inside.

Dr. Macdonald has reported two cases by the Koeberle method that recovered. I refer to one typical case by the drop method, where a surgeon had every opportunity to save his patient, but he lost her.

Some one has alluded to English surgical work along this line. I think the results in England from Porro operations have been fine, but are rejected, and in the literature of the subject there is a tendency to reject Cesarean section and adopt the Porro operation. I believe that is the tendency in Germany.

In alluding to my own work and the mortality following the nœud, you will find a sufficient number of cases to verify my position. The statistics, however, are not quite as large as some of our friends would have us believe. I might refer here to a case. On my way to New Orleans I was asked to stop off and see a patient with two prominent physicians. The case was one of extra-uterine pregnancy at term. The patient was in collapse when her physician saw her. He insisted upon operating in the case. He opened the abdomen, delivered a large child, and attempted removal of the placenta, which was followed by a copious hemorrhage. The placenta was quite generally attached to the posterior wall of the uterus. A rubber ligature was applied after delivery of the uterus and placenta. The pedicle was transfixed with

a darning-needle and the toilet was made, the abdomen closed, and the woman made a good recovery.

I will refer briefly to my own cases. My early cases were fibroids as large as a child's head, blocking the birth passage. There was difficulty in passing a catheter without some compression of the fibroid. In some three or four cases there was scarcely space left to pass the catheter between the tumor and the pubic arch. One fetus was so large that it filled the abdomen up to the diaphragm. The woman was shipped to me in the erect position. She could not lie down. She had a child at home with appendicitis, and the surgeon there operated on the child for that disease, and asked me to do a Porro for him, which I did. Both mother and boy made splendid recoveries.

Of my other cases, three are living, two Scotch women and one colored woman. Some of you here may have witnessed the Porro that was performed on the colored woman. She was a domestic by occupation, and had been married for ten years. Her husband was a caterer. Conception followed his absence of three months. She was married nine years before she conceived. I operated on her the day she was going into labor. When I operated, Dr. T. Gaillard Thomas's assistant, Dr. Nicol, and also Dr. Boldt were present. She made a splendid recovery, and has a fine mulatto boy.

Another case was a domestic, Irish, married, aged twenty--nine years, and she was the woman I referred to with a fibroid blocking the birth passage. I was called on a Sunday afternoon with a physician who thought it was a case of pelvic impaction or sacculated uterus with posterior displacement. I concluded there was a fibroid present, and agreed upon immediate operation, which was performed. The patient recovered.

The last case I operated on has just gone home. She was under the care of Dr. Drake, who recognized the existence of fibroids, with complete pelvic impaction, with multinodular ones above. This woman was suffering greatly, and it seemed as though she would abort soon if something was not done. There was great disturbance from overdistention, although she was not more than six or seven months gone. This was a supra-vaginal (extra-peritoneal) amputation, with Koeberle nœud. Recovery.

Lastly, let me emphasize in this connection the total absence of hernia following the extra-peritoneal method of dealing with the pedicle. I have never yet had a case of post-operative hernia following the extra-peritoneal method of dealing with the pedicle.

Someone last evening alluded to the vicious adhesions about the

vaginal incision, and even about the pedicle. I might here allude to the reported cases of Marcy, five or seven post-operative deaths from bowel obstruction due to adhesions to pedicles and to surfaces painted with solution.

Dr. Longyear.—I would ask Dr. Price to give us his results in regard to post-operative hernias where the Koeberle method is used.

Dr. Price.—I find more ventral hernias about the umbilicus in women who have never had an operation; I presume two to one to those that have hysterectomies. This percentage may be greater. I presume of some fifteen hundred women that I have delivered at the Preston Retreat there were about 5 per cent. that had umbilical hernias. I said to these patients that if you will come to me when you are weaning this baby I will close the hernia for you. Five of the number have had their ventral hernias closed.

In the last five years I have had two operations for hernia following the use of the Koeberle nœud, and that brings up the interesting question now that you hear men allude to, hernias following the use of the drainage-tube. If you will study your cases carefully you will find the hernia occurs in the upper part of the incision oftener than it does about the seat of the drainage-tube. I care nothing for hernia if I can save a woman's life. It is the saving of life with me every time.

The septic conditions antedating operations rather favor feeble union —marked anemia due to ruptured ectopic pregnancy favor ventral hernias. Early rising and travel before organization and consolidation of incision favor hernia.

Dr. Ricketts (closing the discussion).—The point made by Dr. Goldspohn as to the location of the cervix is well taken, and I am under obligations to him for calling my attention to it. It was well up, and dilatation was not taken into consideration for one moment on account of the condition of the patient. We felt that dilatation was impracticable, and I am of the opinion had it been resorted to, or had we made an effort to extirpate the fibroid, we would have lost the patient with that procedure. Bear in mind that this patient was in bed from January 10, until May 22d, 1896. The condition of things was such that I felt at the time the main object was to save the mother. As to the fetus and the placenta, they, as I have said were small for near the fifth month.

As to doing the operation of election, I am of the opinion more than ever that a Porro was the operation to do in this particular case. Considering the condition we found in the woman's pelvis, with the rise of pulse and temperature, had we undertaken total extirpation of

the uterus I believe we would have lost her under those circumstances. I do not wish to be placed on record here that I am one of those who would do a Porro in every case. Not at all. The operator must be the one to decide that. After the abdomen is opened he can then decide whether to resort to total extirpation or to operate by the method of Porro. It is dangerous ground for any man to say that he would do nothing but a Porro. It is also dangerous ground for him to say that he would do nothing but resort to total extirpation. And there is where the success in these cases lies, that after opening the abdomen the operator himself should try, at least, to be competent in selecting the operation for the particular case in hand.

THE TREATMENT OF PUERPERAL INFECTION.

By H. W. LONGYEAR, M.D.,
DETROIT.

The more recent discoveries relating to the laws governing bacteriological growth, the still more recent achievements in the constantly broadening line of serum-therapy, and the over-reaching tendency of the abdominal surgeon to attempt to make the knife the arbiter of all human ills, render the consideration of this subject at this time and by this Association a matter of duty as well as of interest. The subject, considered in all of its details, is of such an extent that to touch upon them all would far exceed the scope of this paper, even if it were within the ability of the writer to do so. This being the case, I shall try to bring before you only the salient points, hoping that with the discussion which they will evoke valuable material may be obtained.

Preventive treatment must necessarily receive our first consideration, as the story told by the statistics of recent years on this subject indicates that a far greater number of lives of puerperal women have been saved by prophylaxis than by therapeusis. It is here that the old maxim, "an ounce of prevention is worth a pound of cure," has proven doubly true.

The progress of the prophylactic treatment of puerperal infection having its inception at about the same time as that of the new era of surgical antisepsis as inaugurated by Lister, its development has been along the same lines as those followed in the prevention of sepsis in the field of general surgery. Puerperal infection is a surgical disease, and being such should receive surgical treatment. Phlebotomy, cataplasms, antiphlogistics, and other equally uncertain, empirical methods of the old days must give way to the more positive, certain, and scientific methods which in their action are directed toward the evil at its root, and have for their aim the destruction of the microbe and the neutralization of ptomaïnes.

Since the days of Semmelweiss, who first drew the attention of the medical world to the true nature of puerperal fever, to the present time, the mortality of the lying-in room has become steadily less, and the maternity hospital, having passed through a period of evolution during this time, from the most dangerous place in which a woman could be confined (as it was then) has now become the safest—a true haven of refuge for woman in the most trying hour of her life. Success in the breaking down of the mortality in these institutions has been attained only as the result of the incessant, watchful care of the experienced physicians in charge, and without which no maternity hospital or obstetrician can excel in the saving of these lives. *Eternal vigilance* in this avocation is the price of life, and no physician should undertake the duties of the accoucheur unless he is prepared to pay this price.

In perfect results in institutional maternity work, the Preston Retreat, of Philadelphia, while under the supervision of Dr. Joseph Price, probably excelled all other institutions of the kind in the world, as he reported in 1892 eleven hundred confinements without a death.

All parturient women, however, are not so fortunate as to be able to take advantage of the watchful care and immunity from danger offered by one of these ideal maternities. Many, fortunately, can be cared for by intelligent physicians who are alive to the advantages of modern methods and ideas; but the vast majority of them cannot, for various reasons, command this kind of skilled attention, and it is among this class that infection plays sad havoc. The uneducated midwife or ignorant, self-styled physician, allowed by the laxness or total lack of laws on this subject in many of our States to practise without evidence of education, ability, or fitness, is responsible for the most of this wanton and reckless waste of human life. Medical men throughout this country should work unceasingly until, by the education of the people and especially of the law-makers, every State in the Union shall have laws enacted that will protect its women against this kind of fiendish ignorance and incompetency. The writer speaks feelingly on this subject, as he comes from a State that is unprotected in this respect, and in consquence is the dumping-ground for quacks, medical ignoramuses, and self-made midwives of many of the adjoining States whose enlightened legislators have passed laws which have

resulted in purging their territory of these death-dealing parasites.

Statistics regarding the mortality of women attended by midwives cannot be obtained in this country. With a view of collecting such statistics, the writer, through the office of the Board of Health of Detroit, communicated with the health boards of several of our largest cities, but nothing could be learned on the subject. As pertinent to this subject, and as illustrating the difficulties sometimes encountered in obtaining these statistics, I quote the following from the last annual report of J. L. Hess, M.D., Health Officer of Cleveland, O.: ". . . I wish to call your attention to what appears to me to be criminal negligence on the part of physicians and midwives with reference to the reporting of puerperal fever. The record shows only one case reported with twenty-eight deaths from the same cause. On reviewing the records for several years back I find this same deplorable condition of affairs to have existed. I therefore feel the necessity of this department resorting to the courts to compel those who have charge of patients afflicted with this disease, which is so destructive to life, to report the same to this office, that we may be able to place such patients under proper quarantine."

This health officer is evidently attempting to quarantine puerperal-fever patients, with the very natural result that he complains of, and with the same result that would be reached if tried by other health officers. At my suggestion the health officer of the city of Detroit now requires physicians signing death certificates of persons dying of puerperal disease to state the names of other physicians or midwives (if there be such) who have attended the cases. By this means we hope to obtain some statistics in this matter.

The greatest mortality from puerperal infection occurs in localities where people are thickly crowded together, as in the towns and cities, while in the sparsely settled country cases are extremely rare, which immunity is doubtless due to the comparative isolation of the patients. Isolation in institution maternity work has been found to be of the greatest prophylactic value.

Specific prophylaxis may be said to consist mainly in the absolute *cleanness* of accoucheur and nurse. The obstetrician, like the abdominal surgeon, must be *habitually* clean. He who attempts

to cleanse himself on occasions, or only at such times as he thinks it necessary to meet the demands of each case, will experience about the same so-called "unlucky streaks" of unfortunate cases of "mysterious" deaths that happen to the abdominal surgeon of similar habits. The spasmodically clean man, who goes about his daily business with his finger-nails "in mourning," and has, like Aunt Dinah, these general "clarin'-up spells," has no place in modern aseptic midwifery. If a general practitioner, he must ever bear in mind the thought of the prevention of contamination of clothing and person. The physician who habitually sits on the bed or other article of furniture, in rooms occupied by patients suffering from contagious or infectious disease, or otherwise allows his clothing, or parts of his person that cannot be immediately washed, to come in contact with the patient or articles that may be infected, cannot be a safe person to enter the lying-in room. His clothing not only should be clean, but while attending the case it should be completely covered by a gown in such manner that the patient, the bed, and the operator's hands will not come in contact with it. The doctor will often go, without a thought of harm, to an accouchement in an uncovered suit of rough woolen clothing, that perhaps he may have worn for months, but would look with horror on the idea of his appearance at the function in a suit of white linen worn for the same length of time—and yet the linen would be the cleaner! Out of sight is apt to be out of mind. The dirt easily seen is easily guarded against, while that which is unseen becomes dangerous.

Dependence on chemicals *only* for disinfection of the hands is dangerous. Their application should invariably be preceded by the vigorous use of a stiff nail-brush with plenty of warm water and soap, which will remove not only the visible dirt, but also the natural sebaceous material which may protect the microbe from the action of the disinfectant. The emollient and soap to be used should be kept in an aseptic condition, which is easily accomplished by having them contained in artists' tubes. The German green soap is convenient for this purpose, and it, as well as the vaseline or other emollient, may be sterilized by heat either before or after being placed in the tubes. The clothing and bedding of the patient should be fresh from the laundry. Pads and napkins may be sterilized by heat and kept wrapped in sublimate gauze until used.

At the commencement of labor the patient should receive a full bath of warm water and soap, and at the same time the hair about the genitals should be disinfected with a solution of corrosive sublimate 1: 2000, after being thoroughly washed with soap and water, a plain enema given, and the preparatory cleansing finished by a vaginal douche of 1:5000 sublimate solution. If the patient has had a history of leucorrheal discharge the vagina should be thoroughly scrubbed with soap and water before the use of the douche. If the instruments have been used, or if the patient has had a leucorrhea previous to labor, a 1: 5000 sublimate douche should be used at the termination of labor; but in normal cases this would seem uncalled for, and should not be used perfunctorily, excepting, perhaps, in institution work, where the cases are attended by inexperienced physicians or students. At the completion of the third stage of labor the vagina and perineum should be carefully examined and all tears accurately closed with sutures. Daily vaginal irrigation during the lying-in is not necessary or advisable in normal cases. The apparatus for using the douche should be sterilized by placing it in boiling water for several minutes immediately before using. Following labor the toilet of the parts must be made with the most strict aseptic precautions. Sponges or wash cloths should not be seen in the lying-in room. A new piece of sublimate gauze for each washing of the parts avoids all danger of carrying infection by dirty sponges and cloths.

In cases of abortion the first principle of treatment should be the complete removal of the contents of the uterus. To insure this the endometrium should be explored in all cases in which the physician himself has not had ocular evidence that the whole product of conception has been expelled from the uterus. When dilatation is sufficient this is best accomplished by the index-finger of the operator, and all adherent and loose portions of the secundines removed by it. If dilatation is not thus sufficient, the usual method is to dilate and curette, if symptoms indicate the incomplete emptying of the uterus. This means considerable of an operation, and is not usually resorted to as a prophylactic measure. To facilitate the easy exploration of the uterus, and to avoid the formidable operation of dilatation and curetting in these cases, the writer several years ago designed and has since used a forceps which has made the treatment of abortion a very simple matter both

to the patient and physician. Owing to its shape and construction it can be used with but slight dilatation of the cervix, the blades opening freely within the uterine cavity without further

FIG. 1.

Dr. Longyear's abortion forceps.

FIG. 2.

Dr. Longyear's uterine drainage-tube.

dilating the canal. The instrument is especially designed for use in cases where a dilatation is slight, when the secundines can be rapidly removed by morcellation. With the patient in the dorsal

position, the index-finger is placed against the cervix as a guide, the forceps passed into the uterus, every part explored, and the contents removed piece by piece. Since beginning the use of this instrument I have tamponned for hemorrhage due to abortion but once, and have not used the curette at all for the removal of retained secundines. It allows of an operation that is practically painless to the patient, and quickly and thoroughly accomplishes, without the necessity of anesthetic or assistant, in a surgical and aseptic manner, that which the clumsy tampon, with its long-drawn-out agony and uncertainty, has been accustomed to do. If the cervix is sufficiently dilated to allow of the finger being used as a guide to the fragments to be removed, so much the better for the speed of the operation; but it is not a necessity, as my experience has demonstrated that by the intelligent manipulation of the instrument all parts of the cavity can be gone over and everything perfectly removed without the aid of the finger within and without danger of doing injury to the uterine tissue. Experience has shown that cases of abortion, when treated in this way, make the most rapid recoveries, the subsequent flow being quickly over and involution rapid, which is doubtless due to the complete removal by the instrument of the remains of the decidua, which under ordinary circumstances require considerable time to liquefy and pass out of the uterus. With the operation immediately followed by intrauterine irrigation with sublimate solution, the uterus contracts and the closed cavity ceases to offer invitation to septic germs.

In cases of infection following abortion an exploration of the uterine cavity by this means should be made without delay, the decomposing secundines which are usually found in such cases removed, and the cavity thoroughly douched with a 1:2000 sublimate solution, used by means of the double canula. The manipulation should be as gentle as possible and any traumatism of the uterine tissue avoided, which can be accomplished much more safely with this instrument than with the tenaculum and curette. The curette, in recent cases, accomplishes no more than the forceps, and its use is attended by the additional danger caused by the dilatation which is usually necessary to its use, and the laceration caused by the tenaculum. In cases of longer standing the curette, by removing the zone of granulations which stands as an opposing barrier against the entrance of septic germs, may, if used

without the knowedge of this fact, still further add to the danger of the case. After the use of the curette in such cases, the douching of the cavity should be followed by the application of an agent of a mildly caustic nature for the purpose of forming a protecting coating over the denuded surfaces. For this purpose, and, in fact, in all cases not of recent origin treated by me, I apply a mixture of iodine, carbolic acid, and chloral, which, besides having a powerful germicidal action, has the merit of acting as a caustic and searing over abraded surfaces without doing injury to healthy mucous membrane, if the excess of the chemical is washed away after its application. The formula (copied from some clinical notes) is as follows: Crystallized iodine, two parts; carbolic acid, two parts; chloral hydrate, one part; water sufficient to dissolve. The iodine and carbolic acid are first liquefied by heat, the chloral added, and enough water to dissolve. My method of using it is, after washing the cavity clean of all débris, to inject about half a drachm, then, with a swab of absorbent cotton on dressing forceps or applicator, apply it to all parts of the endometrium, rubbing it in thoroughly, after which the douche is again used and a drainage-tube inserted. The action of the chemical on the blood and other albuminous substances within the uterus is to shrink and harden them, when they are rolled up and loosened from the uterine wall by the swab and removed by the douche, leaving the endometrium quite free from débris. In no case where I desire drainage do I pack the uterine cavity with gauze, as it causes pain to the patient, drains only the serum, and causes the retention of clots and other débris that would otherwise be expelled by the gradual settling together of the uterine walls that naturally occurs when the cervical canal is kept freely open. The intrauterine drainage-tube which I use is one that I first devised for use as a stem pessary. As you will see by the sample I will show you, it is made of silver, and is held in place, when introduced, by two flexible wire arms the extremities of which are knobbed to prevent injury to the endometrium. Before introduction these arms are closed within the tube by means of the staff to which the instrument is attached when in use. The slots through which the arms pass when liberated by the withdrawal of the staff allow of the drainage of fluids and débris from the uterus, and by virtue of their position, being placed behind the arms, cannot become clogged by mucous membrane being forced into

them. Through a small hole in the flange of the instrument a shotted silver wire is made fast to facilitate its removal in case it slips within the os. The tube is easily removed by making traction on it with forceps by grasping the slot or the end of the tube itself. The use of the tube renders the irrigation of the cavity as often as desired a very simple matter, as it can be removed before and introduced afterward without difficulty, and an unobstructed canal is assured. Its presence does not usually cause any discomfort.

In both the surgical and medical treatment of infection following childbirth much damage may result from the application of empirical treatment without regard to the exact pathologic condition present and the particular kind of infection to be dealt with. The use of the intrauterine douche with a patient suffering with a ruptured pus-tube; the application of hot poultices and fomentations, and the administration of veratrum and other debilitating drugs, to cure a septic endometritis and peritonitis, and other similar "misfits" between remedies and disease, are too familiar to the observation of all of us. Correct diagnosis, when possible, should include the nature of the infecting microbe. This can sometimes be determined by the history of the case—as in gonorrheal infection—but a culture should be made when facilities are at hand for doing so, and the microscope will sometimes assist in making the diagnosis without the culture. In these days of exact and scientific methods of surgical treatment and the increasing use of the various antitoxin serums in the systemic treatment of microbic infection scientific diagnosis becomes a necessity.

The usual infection, beginning with endometritis, accompanied by chills, fever, and other constitutional symptoms, may originate from a number of causes, and be slow or rapid in development according to the virulence of the specific microbe causing it, the extent of denuded absorbing surface in the genital tract, and the ability of the individual to combat the toxin in the blood. These points being conceded, and the specific microbe causing the infection in a given case determined, the plan of treatment should be, first, to destroy or diminish the intensity of the action of the microbe at its seat of operation; second, to diminish the extent or change the character of the denuded absorbing surfaces; and, third, to assist the natural functions of the body to neutralize, combat, and

eliminate the toxin in the blood. The first indication being the cleansing of the uterine cavity, the endometrium should be irrigated with an antiseptic—preferably sublimate solution 1:5000—and then thoroughly and *gently* explored for retained portions of secundines, and all such, if found, removed in the manner best calculated to do it completely and with the least liability of causing trauma to the uterine tissue. Where the cervical dilatation is sufficient, a large, dull scoop-curette is efficient and safe for this purpose. If the os is too small to admit of this the abortion forceps may be used. In these cases, which usually commence soon after parturition, the use of the sharp curette is not advisable, as it is liable to open up the sinuses and cause fresh denudations, and so favor absorption. In simple cases depending on the retention of decomposing secundines or the retention of decomposing lochial discharge, due to cervical flexion or edema, the evacuation of the uterine cavity by these means, and a few irrigations, with free drainage by the uterine drainage-tube when necessary, will serve every indication and prevent that which, from being a mild infection, would soon become general from the rapid absorption of toxins. The staphyloeoccus is usually the pyogenic factor in these cases. When, however, we have a more virulent infection, as from the streptococcus, bacillus coli communis, or diphtheria bacillus, the treatment, while begun in the same manner, must be carried further, both locally and generally. The whole intrauterine surface, after the first irrigation, should be dried, then a thorough application made of an agent like the carbolic-iodine mixture before mentioned, free drainage assured by mechanical means if necessary, and the vagina receive an injection of the peroxide of hydrogen, one or two ounces, every two hours. The uterine cavity should be irrigated two to three times in twenty-four hours, and the application made once a day until the symptoms subside. Here the use of the sharp curette should also be avoided. The instrument would, in my opinion, be as liable to do damage in case of this kind as it would if used in cases of diphtheria of the pharynx. All abrasions are covered with a membranous exudate, which, if pulled off, leaves a raw surface unprotected by granulations. Hence the agents should be such as to destroy the vitality of the exudate and cauterize the raw surface where it is removed. Neither is the gauze-packing a useful application in these cases, as it retards

rather than facilitates drainage, by plugging the outlet of the infected cavity and holding the uterus in a state of distention.

The medical treatment should begin, continue, and end with *eliminatives*, using preferably the salines, whose action tends to drain the pelvic viscera and keep the peritoneum active in combating the extension of infection to this serous membrane. Alcohol, strychnine, and quinine have their places as supporting agents, and should be given as such when the symptoms indicate. Quinine may also be beneficially given to reduce temperature and combat the systemic intoxication, in one large dose a day. Opium has no place in the treatment of this disease, as it tends to retard functional action of the secretory organs, and thus prevents elimination. In assisting the system to directly combat the toxins absorbed as a result of the microbic action in the uterus, nuclein is, theoretically, the remedy indicated, as it fortifies and strengthens the white blood-corpuscles in their poison-resisting properties, and I think it should be administered persistently by the hypodermatic method in all cases, although my own experience with it has not been extensive or positive enough to make any useful deductions from. The medication which bids fair thus far to be of the most paramount use in puerperal infection is that comprised under the head of serum-therapy. Few reports have yet been published regarding the use of the serum antitoxins, but those that have been seem to prove that in cases of infection due to poisoning by the streptococcus alone (the most common microbic cause in puerperal cases), the streptococcic antitoxin, when used early, is a curative agent of great value; but in mixed cases of infection, in which, besides the streptococcus, the colon bacillus, the bacillus fetidus, the staphylococci, bacillus pyocyaneus, and other microorganisms are found, the streptococcic antitoxin has little or no beneficial effect.[1] I have been unable to find any reports of cases of puerperal septicemia treated with diphtheria antitoxin, and as my own experience has apparently demonstrated its usefulness in appropriate cases, and to call attention to the fact that the Klebs-Löffler bacillus should not be lost sight of as a factor in the consideration of the infection of puerperal women, I will briefly report two cases which bear upon this point. The first case was men-

[1] Barton Cooke Hirst in The American Journal of Obstetrics, August, 1896.

tioned by Dr. B. F. Shurly in a paper in the *Therapeutic Gazette*, February, 1896:

Mrs. J., aged twenty-four years, Armenian, primipara, entered the Woman's Hospital, in labor, November 17, 1895; temperature 98.4°, pulse 74; twenty-five hours in labor; forceps delivery; slight tear in the skin at fourchette, not repaired. Temperature after delivery 100°, pulse 100. Pulse and temperature dropped to normal, and remained so until November 21st, when, after a chill, the temperature rose to 102°, pulse 110, morning, and temperature 103.8°, pulse 114, evening.

November 22d, morning, temperature 101.2°, pulse 96; noon, temperature 103.8°, pulse 114; evening, temperature 102°, pulse 102; vaginal erosions covered with a grayish-white exudate; quinine sulphate, two grains every two hours; spiritus frumenti, one drachm every hour; sublimate douche morning and night. November 23d, noon, temperature 104°, pulse 106; evening, temperature, 104.2°, pulse 110; complained of pain in lower part of abdomen; removed to isolation ward; hydrogen peroxide, two drachms, injected into the vagina every two hours; intrauterine sublimate douche, 1:5000, morning and night, and potassium permanganate solution, one grain to the ounce, at noon. November 24th, morning, temperature 100.8°, pulse 98; noon, temperature 104°, pulse 112; evening, temperature 104.2°, pulse 100; pain in abdomen continues; turpentine stupes applied; continue intrauterine medication, also quinine and whiskey. November 25th, morning, temperature 99.4°, pulse 108; noon, temperature 100.2°, pulse 92; evening, temperature 101.4°, pulse 100; very restless; backache during night; nuclein solution (P., D. & Co.) eighty minims hypodermatically three times a day. November 26th, morning, temperature 99.2°, pulse 94; noon, temperature 103.4°, pulse 100; evening, temperature 105°, pulse 96; vomited several times during morning; very restless; severe backache; vomited after supper; respiration short and irregular; bowels moved several times, watery and yellow. November 27th, morning, temperature 100°, pulse 94; noon, temperature 101.4°, pulse 98; evening, temperature 102.2°, pulse 80; lochial discharge colorless; tincture cactus grand., fifteen minims t. i. d.; bismuth subnitrate, fifteen grains every two hours. November 28th, morning, temperature 104°, pulse 90; noon, temperature 101.2°, pulse 98; evening, tempera-

ture 104.2°, pulse 96; right side of vulva red and greatly swollen, extending to coecyx, and margin of inflammation marked by a distinct ridge; patient very weak; culture from uterus and vagina taken by pathologists, but tube broken on the way to laboratory; Basham's mixture, two drachms every two hours. November 29th, morning, temperature 100.2°, pulse 90; noon, temperature 103.6°, pulse 90; evening, temperature 103.2°, pulse 82; vomited during night; bowels loose; sharp pains in abdomen and tenderness on pressure; lies with knees drawn up; inflamed area extended over buttock; coughed some; direct microscopical examination made of discharge by Dr. Sickles, who reported pus bacteria and a bacillus "not unlike that of Klebs-Löffler;" alcohol bath given. November 30th, morning, temperature 100.4°, pulse 92; noon, temperature 102.6, pulse 94; evening, temperature 104.6°, pulse 96; at 11.30 P.M. injected into muscles of back ten cubic centimetres (1000 units) of diphtheria antitoxin serum (P., D. & Co.'s). December 1st, morning, temperature 101.6°, pulse 90; noon, temperature 102.6°, pulse 94: evening, temperature 103.6°, pulse 90; temperature before injection 103.6°, at 12.30 A.M. 104.2°, at 2.30 A.M. 103.2°, at 4.30 A.M. 103.6°, at 6.30 A.M. 101.8°, at 8.00 A.M. 101.6°; injected ten cubic centimetres (1000 units) of diphtheria antitoxin serum at 3 P.M.; temperature at 4 P.M. 102.6°, at 5 P.M. 101.8°, at 7 P.M. 103.6°; cutaneous inflammation extends posteriorly to waist-line; primary seat of swelling nearly gone. December 2d, morning, temperature 101.6°, pulse 88; noon, temperature 101°, pulse 86; evening, temperature 101.4°, pulse 88; cutaneous swelling extends half-way down thighs and to apex of scapula; vomited once during the day; took culture from vagina for pathologist of Board of Health (result negative); exudate in vagina gone, and very little débris comes with douche from uterus. December 3d, morning, temperature 98.8°, pulse 72; noon, temperature 101.4°, pulse 88; evening, temperature 103°, pulse 86; cutaneous inflammation extends to clavicle; grayish discharge mixed with lochia. December 4th, morning, temperature 98.4°, pulse 84; noon, temperature 98.6°, pulse 76; evening, temperature 99.4°, pulse 80; bowels moved freely, watery in character; enema given; patient looks much better. December 5th, morning, temperature 98.4°, pulse 78; noon, temperature 97.2°, pulse 80; evening, temperature 98.4°, pulse 78; cutaneous inflammation has

entirely disappeared; appetite good; bowels moved naturally; vaginal carbolic douche once daily; port wine with meals. December 6th, morning, temperature 98.4°, pulse 78; noon, temperature 99°, pulse 78; evening, temperature 100 4°, pulse 88; desquamation of skin began; sulphonal for insomnia. December 7th, morning, temperature 98.2°, pulse 76; noon, temperature 99.2°, pulse 78; evening, temperature 99.6°, pulse 80; rested well during night; douche water (vagina) perfectly clear; sat up half an hour. December 8th, morning, temperature 98.4°, pulse 78; noon, temperature 99°, pulse 80; evening, temperature 100°, pulse 90; medication (quinine and whiskey) diminshed one-half; patient disinfected and transferred to private room. December 9th, morning, temperature 98.4°, pulse, 90; noon, temperature 99.2, pulse 88; evening, temperature 100.2°, pulse 90; rested well during night; appetite good; milk coming in breasts; lochia normal. After this patient continued to improve and was discharged December 15th. Patient reported on June 1st—both mother and child well.

Two cases were confined the day following the confinement of the foregoing; each had a chill the third day after, the same grayish membrane was present in the vagina, the sequence of symptoms was the same as with the first case, and they both died, one on the third day after the chill and the other on the seventh day after the chill, with well-marked symptoms of peritonitis. Neither of these patients was treated with the antitoxin, but otherwise the treatment was the same as with the one who was so treated. The symptoms of peritonitis had apparently begun, in the first case, on the evening before the administration of the first dose of antitoxin.

An autopsy was made by Dr. Hickey, the hospital pathologist, on the body of the case that died on the third day after the chill, and the following notes made: Green, purulent fluid in abdominal cavity; intestines adherent; appendix normal; left Fallopian tube enlarged and infiltrated, containing no pus, but evidently indicating the track by which the microbic infection entered the peritoneal cavity; uterus showed little that was abnormal, having no pus-pockets in its walls and being fairly clean inside, with evidences of congestion of the endometrium. Bacteriological examination of the placental site showed the *staphylococcus pyogenes albus*. Unfortunately no examination of the fluid in the abdomen was made. The conditions found at this autopsy would not indi-

cate the usefulness of curettage in similar cases; neither would a hysterectomy be indicated in another case presenting a like history, as the uterus and Fallopian tubes had acted only as a track by which the bacteria entered the abdominal cavity, and did not present any collections of pus or other pathological condition that would warrant the removal of these organs.

The second case treated by the diphtheria antitoxin occurred at Harper Hospital in the service of Dr. Carstens, who, at my suggestion, allowed the trial of the serum to be made. This history is as follows:

Mrs. F., aged twenty-eight years, primipara, beginning eighth month of pregnancy, entered Harper Hospital March 13, 1896, for treatment for albuminuria. Premature delivery was induced and delivery accomplished by forceps March 16th. On the 18th a chill occurred, after which temperature was 102.4°, pulse 126. Intrauterine sublimate douche.

March 19th, morning, temperature 102.4°, pulse 116; noon, temperature 101.6°, pulse 104; evening, temperature 103.4°, pulse 122; chill at 3 A.M.; vomited; intrauterine douche; insomnia; pain in pelvic region. March 20th, morning, temperature 100°, pulse 110; noon, temperature 104.4°, pulse 120; ten cubic centimetres (1000 units) of diphtheria antitoxin (P., D. & Co.) given hypodermatically at 3.45 P.M.; douche discontinued. March 21st, morning, temperature 100°, pulse 104; noon, temperature 103.8°, pulse 134; evening, temperature 100.4°, pulse 100; had a good night; ten cubic centimetres of antitoxin at 7.25 P.M.; quinine sulphate, five grains t. i. d.; whiskey, two drachms every four hours. March 22d, morning, temperature 100°, pulse 102; noon, temperature 101.6°, pulse 110; evening, temperature 100.8°, pulse 104; had a good night; no antitoxin. March 23d, morning, temperature 98.2°, pulse 100; noon, temperature 100.6°, pulse 110; evening, temperature 99.8°, pulse 108; good night; fifty-four ounces of urine passed in twenty-four hours; vomited quinine sulphate; culture taken from vagina (result negative). March 24th, morning, temperature 99°, pulse 92; noon, temperature 99.6°, pulse 80; evening, temperature 99.6°, pulse 100. After this date patient convalesced, with slight daily variations in temperature, and was discharged April 4, 1896.

While the evidence procured from bacteriological examinations

in these cases was not positive enough to establish a certain diagnosis of diphtheria, the results of the use of the diphtheria antitoxin either prove that they were cases of diphtheria or that this serum has antimicrobic properties beyond those which it exerts on the Klebs-Löffler bacillus. "One swallow doesn't make a summer," neither do I expect the history of these two cases will establish any principle of practice, but it may lead to a line of experimentation by which successful principles may be evolved.

In cases suffering from gonorrheal infection the diagnosis is usually not difficult. The history of a troublesome leucorrhea before confinement, the mild constitutional symptoms regardless of temperature (unless the peritoneum becomes involved), the purulent discharge from uterus and vagina, without membranous exudate on denuded surfaces, patulous os, and uterine cavity filled with purulent fluid, all points to the diagnosis. Where the presence of the gonoccoccus in the discharge can be demonstrated the diagnosis should be confirmed in this manner, but the history of the case with the clinical manifestations will usually present evidence sufficiently conclusive.

Here, if the disease is to be stayed and tubular peritoneal infection prevented, treatment must be prompt and decisive, and is on about the same lines as followed in the local treatment recommended in other forms of infection, the prime object being the thorough disinfection of the uterine cavity without adding to the danger of the case by traumatic injuries or rough treatment. Hence, in the treatment of acute cases of gonorrheal infection of the uterine cavity, the use of the tenaculum, dilator, sharp curette, and gauze-packing should be avoided. Without going into further detail, and as illustrating the behavior of temperature and pulse, and showing the plan of treatment usually followed by me in this form of infection, I submit the following case, which I saw for the first time on the eighth day after confinement:

Miss B., aged twenty-two years, primipara, entered the Woman's Hospital, and was an inmate for several weeks before labor, which occurred July 8, 1896. Had a leucorrheal discharge up to the time of labor. Labor normal, with the exception of a rupture of the perineum of the first degree, which was closed by three sutures. Temperature and pulse normal before delivery.

July 9th, evening, temperature 102°, pulse 126; lochia scanty.

July 10th, morning, temperature 98.6°, pulse 80; evening, temperature 100.2, pulse 100; lochia scanty, pale yellow; abdominal pain; turpentine enema. July 11th, morning, temperature 98°, pulse 76; evening, temperature 101.6°, pulse 102; lochia more colored; suppository aristol and boric acid twice a day. July 12th, morning, temperature 98.8°, pulse 84; evening, temperature 100.4°, pulse 92; quinine, six grains morning and night; vaginal sublimate douche twice a day. July 13th, morning, temperature 98.4°, pulse 80; evening, temperature 100.2°, pulse 90. July 14th, morning, temperature 99°, pulse 88; evening, temperature 100.6°, pulse 94; pain in abdomen. July 15th, morning, temperature 98.6°, pulse 96; evening, temperature 102°, pulse 104; turpentine stupes to abdomen; sutures removed; wound healed; lochia very scanty; purulent discharge. July 16th, morning, temperature 100.8°, pulse 100; evening, temperature 103.6°, pulse 104; sublimate intrauterine douche to be used twice a day; patient chilly at 1.15 P.M. July 17th, morning, temperature 99.6°, pulse 100; evening, temperature 103.4°, pulse 104; quinine ten grains, acetanilide six grains, once a day; sal Rochelle, two drachms every morning. July 18th, morning, temperature 103°, pulse 120; evening, temperature 103°, pulse 110; slept well during night; no lochia; intrauterine treatment with iodine and carbolic-acid mixture; os patulous and drainage tube not necessary; turpentine enema. July 19th, morning, temperature 101.4°, pulse 108; evening, temperature 102°, pulse 104; copious intrauterine douche of hot water followed by saturated solution of boric acid twice daily, followed by iodoform suppository in vagina; intrauterine application of iodine and carbolic acid. July 20th, morning, temperature 100.8°, pulse 96; evening, temperature 102.4°, pulse 94; lochia copious. July 21st, morning, temperature 100 8°, pulse 96; evening, temperature 102.8°, pulse 105; lochia scanty and light color; intrauterine application of iodine and carbolic acid. July 22d, morning, temperature 101°, pulse 96; evening, temperature 102.8°, pulse 92. July 23d, morning, temperature 99°, pulse 90; evening, temperature 101.6°, pulse 86. July 24th, morning, temperature 99.6°, pulse 84; evening, temperature 101.2°, pulse 84; hot douche with boric acid discontinued. July 25th, morning, temperature 100.6°, pulse 84. July 26th, morning, temperature 98.4°, pulse 70; no rise above 99.6° after this date.

All cases do not terminate as favorably as the foregoing, and in spite of treatment, or perhaps for the want of it, the infection extends into the Fallopian tubes, when the question of abdominal section may be considered; but this operation is not usually necessary during the acute stage, unless the peritoneum becomes infected, when it should be performed without delay and the diseased appendages removed, the abdominal cavity thoroughly flushed with sterilized normal saline solution, and the incision closed with drainage. In cases in which the appendages became swollen, without evidences of more than local peritoneal irritation, the radical operation had best be deferred until after the puerperal period.

However, if abscess of the Fallopian tubes occurs and the presence of the pus is causing an increase or a continuation of the septic conditions, surgical interference is indicated. If the septicemia is profound, and the symptoms are those of the more virulent microbic action, the pus, if it can be so directed, is best drained through the vagina and radical operation deferred until the dangerous septic symptoms subside. Such cases are usually the result of mixed infection and are the ones usually lost by abdominal section, as the general peritoneal cavity becomes contaminated during the operation. If the pus is the result of the action of the gonococcus only, the danger from peritoneal infection during section is not so great, neither are the symptoms usually so urgent as to demand immediate operation. Dr. Louis Frank, of Louisville, Ky., in an article in the *Medical News*, October 19, 1895, reports a case of virulent septic peritonitis following abdominal section for pyosalpinx of recent origin, in which he found, at the autopsy, gonococci in the fluid of the abdomen. He concludes from this, and from other evidence which he quotes, that gonococci from pus of recent origin may be capable of producing rapidly fatal purulent peritonitis. This view has not been generally held, and if true should be easy of demonstration.

Peritonitis occurring immediately after labor, being almost invariably the result of the infection of the peritoneum by the rupture of some collection of pus—usually an old pyosalpinx or abscess of the appendix—by the traumatism of labor, should be treated by abdominal section at the earliest possible moment, and no time wasted over the trial of any other method of treatment, as nothing

else will avail, and each hour without section carries the patient further from hope of rescue, as the action of the disease is intensely rapid, usually causing collapse and death within two or three days.

General purulent peritonitis, resulting secondarily from a continuation of infection from the uterus, I believe to be usually beyond operative treatment; but if the patient is not in collapse, section, lavage, and drainage should be tried.

I do not advocate the removal of the uterus with the appendages in these cases, unless it can be demonstrated that it is acting as a focus of infection by reason of pus-pockets within its walls.

I believe that the fashion of advocating the operation of hysterectomy for the cure of puerperal septicemia is a dangerous teaching and calculated to result in the loss of more lives than it will ever save. Until physicians become wise and skilful enough to determine whether or not the infection of the extensive lymphatic system in and adjacent to the uterus is confined to the tissues to be removed, the operation must be confined to the limitations that obtain in its application in non-puerperal surgery. If it can be demonstrated, either before or at the time of operation, that the uterine walls are riddled with pus-pockets, or if the organ is in any other way the subject of a limited septic disease which is beyond repair, then the organ should be removed; but to remove it for a septic infection of its interior without evidence of other pathologic lesion, with the sole object of cutting off the danger of infection through the lymph channels, is to do an operation the object of which is so uncertain and its dangers so great as to make it an unwarranted proceeding. Other methods of treatment offer these patients far greater chances of recovery.

There are some rare forms of infection that are so virulent and rapid in their action as to baffle all hitherto known methods of treatment. Infection from erysipelas and scarlatina I believe to act in this manner at times, its entrance into the circulation often occurring non-vaginam and at any time during the puerperal state, but, because of the pregnant condition, operating in this intensely virulent manner. Such cases, I believe, offer a good field for the experimental use of the serum antitoxins. A case of this kind occurred in my practice a number of years ago in the person of a healthy young woman, five months pregnant, who was nursing her husband, ill with traumatic facial erysipelas. Her attack

began with a hard chill, followed by high fever and delirium. Labor pains began on the second day, became immediately violent, and before I could reach her bedside the contents of the uterus were expelled intact, with membranes unruptured. The delirium became violent, and she died on the third day following the chill.

For assistance in the preparation of this paper I am indebted to Drs. B. F. Shurly and Jessie L. Herrick for notes of cases and help in the antitoxin experiments.

DISCUSSION.

Dr. Charles A. L. Reed, of Cincinnati.—I had not contemplated speaking on this question, but the paper is so interesting and so thought-bearing that the inclination to say something cannot easily be resisted. Dr. Longyear's instruments are evidences of ingenuity, and I presume he has confirmed their utility and desirability by use. There are some features that commend themselves to me, which may be purely theoretical. I do not like this lock in the currette forceps in the handle. I want one that I can manipulate easily and is less liable to catch. I presume I like that because I have been using the old Emmet currette forceps, which is not unlike this. The blades are fenestrated and not serrated on the margins.

The intrauterine tubes are certainly very ingenious, and the only question is as to the effect of the persistent pressure upon the parenchyma. There must be quite light yet persistent pressure or persistent spring pressure upon the tender tissues, which sometimes forces them to yield, and we may have in this way an infection atrium. These may be theoretical objections, and as Dr. Longyear has had considerable experience, he can possibly explain them.

The intrauterine tubes raise the question of drainage. Drainage is an essential factor in the treatment of these cases, and I believe the more useful practice is to secure that drainage by capillary processes and packing. This is not always satisfactory. I have been in the habit of curetting these cases with a dull curette, preferably with the Emmet curette forceps, and removing by that means the adherent pieces of placenta. I believe that by the use of that instrument small placental segments can be removed without serious damage to the underlying tissues. After that I have been doing what may strike you as being formidable. I have been packing the uterine cavity with pure

carbolic acid—a very narrow ribbon, not a tight pack, but a narrow ribbon carried into the uterus, saturated with this acid, and by this means we get the superficial escharotic effect of the acid, which is not too deep, and we get its profound antiseptic qualities. This is permitted to remain for twenty-four hours, when it is removed the uterine cavity is irrigated with peroxide of hydrogen, and if the cervix remains patulous, as it generally does, a little ribbon saturated with carbolic acid and glycerin is again put in. The glycerin is employed because of its cosmetic properties.

But, talk about these details as we may, the central lesson of Dr. Longyear's paper commands new emphasis. It is the essential principle of drainage. I recently had referred to my service in the Cincinnati Hospital from the venereal ward a young woman who came in with gonorrhea and syphilitic infection. She was five and one-half months pregnant, and two days after admission she miscarried, as the result of the infection from which she suffered, and it was four or five days later when she was transferred to my ward. When she came into my service she had a pulse of 160, a respiration of 60. She had two pronounced extreme depressions—collapsed—and in every way the case was one *in extremis*. There was great distention of the abdominal walls—tympany. I made an incision in the median line, and came immediately upon a large pus pocket. This was emptied, the laminæ of the pus removed from the walls of the cavity, and I could then detect the tubes upon either side, which were nearly the size of an orange. The question was whether to attempt extirpation of the tubes at that time or to treat them conservatively. I resorted to the latter course. I made an incision large enough to easily introduce my finger, and then through the cavity I introduced a self-retaining T-arranged drainage-tube, thus effecting drainage. The woman's temperature dropped within the next thirty hours to normal, and was normal from that time on. This woman is not cured, but we have fenced off a virulent infection. If I had tried to break up the adhesions the infection would have been communicated to the general peritoneal cavity, and she would probably have died. As it is, she is making a happy recovery. This is a case in which the details of operative procedure were suggested step by step by the conditions encountered, and it emphasizes the essential features of drainage.

Dr. W. B. Dorsett, of St. Louis.—I rise to condemn the use of the blunt curette. I do not believe there is an instrument in the shops which is calculated to do more damage than it. You might as well try to scrape the plaster from this wall with a street roller. It is not so much the method of scraping as the instrument itself. If

a man wants to scrape a street he uses an instrument the cutting edge of which is at the proper angle to the street before he can do any work.

I also do not place confidence in the instrument that is used by Dr. Longyear as a placental forceps. I have no doubt Dr. Longyear does good work with it, but I do not think I could. A placental forceps is used for the purpose of extracting loose placentæ and membranes, and not for removing portions of placenta that are tightly adherent to the wall of the uterus. The teeth of this instrument are sharp and can do nothing but damage, it seems to me; but if you use an instrument with which you can grasp friable placenta, or an ordinary pair of fenestrated sponge-holders the edges of which are round, introduce them with the woman in the left lateral position, retract the perineum, if it has not been too badly lacerated, and then, with the aid of a Sims or a bivalve speculum, introduce the forceps, and you can see what you are doing. You can introduce the instrument well into the uterus, take hold of the placenta, and gently draw it out. If you take hold of the placenta with such an instrument as Dr. Longyear has shown us, it cuts off bits of the placenta and you do not remove the placenta en masse. We have not the facility in removing it en masse with an instrument of this kind that we have with other forceps.

With reference to packing and drainage, we should make a great distinction. I certainly would condemn packing the uterus with gauze, but I see no objection whatever to introducing a candle-wick drain to the fundus of the uterus, leaving it in long enough to absorb such material as may be in the uterus, and allowing the material to come away by capillary attraction.

In regard to medication, I have used iodoform suppositories in the uterus with very happy results, introducing them as far as the fundus, and on top of them gauze drainage, leaving it hanging out into the vagina, keeping it applied for twenty-four hours, at the end of which time it is removed and new gauze drainage applied. After the suppositories have melted, the iodoform runs over the inflamed uterus, cervix, and vagina, and is of material benefit.

In regard to serum-therapy, I have tried it in two cases, in one with a good result. One objection, however, surrounds us in the choice of the remedy, and that is we in the West cannot obtain it in the liquid form. It comes to us as a powder, and has to be dissolved and carefully prepared for the syringe. This, it seems to me, detracts from its potency and its general use.

Dr. John M. Duff, of Pittsburg.—I was very much interested in Dr. Longyear's paper, and there are one or two points that I would like to

touch on in the brief time at my disposal. While these instruments show ingenuity, I cannot see how this forceps is a safe one, except in the hands of one who is specially expert. It is too sharp. You pass it up into the uterus, to a certain extent blindly. The uterus perhaps is not dilated sufficiently to even introduce the finger. Passing the instrument up to the fundus, you catch hold of the uterine tissue and tear it, thus creating a wound which will increase the danger of sepsis. In the hands of Dr. Longyear I have no doubt the instrument works perfectly, but I do not think it would in the hands of the average practitioner.

Another point in this connection is this: I believe there is entirely too much curetting and washing out of the uterus subsequent to labor. We must make a distinction between cases in which we have direct infection from the streptococcus and those in which we have an absorption of ptomaïnes from the uterus itself. This is a subject which would take considerable time to discuss; but, as a rule, where we find after our curettement, the temperature goes down, and the pulse does not go down with the temperature, further curettement and washing out of the uterus in such a case will do more harm than good. If both the temperature and pulse go down, and then you have a rise of temperature again, with a corresponding rise of pulse, the curettement can be repeated if it has not been effectual at first. In these cases of miscarriage in the early stages, unfortunately for the profession, we do not get them soon enough. When we do get them sufficiently early, the application of carbolic acid, in my experience, has been better than anything I have used. I employ a 75 per cent. solution of carbolic acid and swab the uterus with it.

I was very much pleased with what was said in the paper in regard to the use of antitoxin. I have tried antitoxin in one case where the woman was almost in *articulo mortis* when I was called in, and I did not see any improvement following its use.

Dr. Walter B. Chase, of Brooklyn.—I have been very much interested in the scientific and classical paper paper of Dr. Longyear, but as the subject is so broad I shall only touch on one or two points connected wtih it.

The remarks of Dr. Reed with reference to the question of direction of drainage in the conditions he mentioned were particularly interesting to me. It seems from what has been said that the Fellows favor drainage upward where section has been made through the abdominal walls. From some experience I have had, and also on theoretical grounds, it seems to me, in a condition such as Dr. Reed has delineated, it makes comparatively little difference to him as to the direction

in which he drains, because he is an expert; but such is not the case with every man. One advantage which accrues from this procedure is that primary union of the abdominal walls is likely to take place, and therefore the danger of subsequent hernia will be largely eliminated; whereas, if the drainage by gauze is downward, we are better able to keep the cavity empty, and we can pull out the gauze at our leisure. I know it is becoming more and more customary with surgeons in the East to resort to the downward rather than the upward method of drainage. If you gentlemen from the South and West will resort to the downward method I think you will be convinced of some of its obvious advantages.

Dr. I. S. Stone, of Washington, D. C.—With reference to the question raised by Dr. Reed and others regarding the forceps exhibited by Dr. Longyear, I must say I think it is an exceedingly useful instrument, for the reason that it will not injure the healthy endometrium. I do not think anyone here in using this forceps ought to injure the endometrium. It is quite possible it might be done by some. If we have an acute uterine infection, and take a sharp curette—as some men at least teach us that they do—and go over the entire endometrium, they open up many avenues for infection. I would oppose, then, the use of sharp curettes in such cases. I do not agree with Dr. Dorsett, that we would not expect to find much free placenta in such a uterus. I believe Dr. Longyear with his forceps can find and remove many small adherent particles of placenta.

As regards the remarks of Dr. Chase in reference to abdominal drainage, I do not think they are quite pertinent, because we are not exactly discussing that phase of the question. We are discussing drainage of the uterus. We are drifting more toward preventive medicine; we want to prevent surgery, so to speak, by carrying out the views advocated by Dr. Longyear.

The treatment of diphtheria by antitoxin is not proven. I do not believe any of the antitoxin injections have proved successful in the treatment of puerperal infection. It is in the experimental stage. I remember Dr. Montgomery's paper, read at Atlanta, and others that have been read on the same subject, and I think it is very much to the credit of surgery that surgeons themselves are now studying more and more preventive medicine. The case is not proven; but there is no reason why somebody should not try to cure some of the cases by such practice. I hope in puerperal infection that some treatment will be devised other than surgical. I am sure advances will be made along this line, but they have yet to be accomplished. I cannot agree that Dr. Longyear's success has proven the case.

Dr. Joseph H. Branham, of Baltimore.—This is one of the most important subjects that can be discussed by the Association. If it is not quite so brilliant curing eases of local infecton after labor as it is to do some of the greater surgical operations, I believe it is more difficult to do, and I think the proper management of eases of puerperal infeetion is negleeted to a very much greater extent than the proper management of the cases ealling for surgical interference.

Dr. Duff touehed upon one point that I am very mueh interested in, and so did Dr. Longyear, and that is, after the treatment of the severe cases by the ordinary eleaning out of the uterus, they do not get well so easily. I have treated a great many cases of loeal infeetion oecurring after abortion, cleaning out the uterus, etc., and it does not make much differenee how you do it, provided you do your work thoroughly. I am in the habit of swabbing out the uterus very thoroughly with pledgets of cotton soaked in bichloride solution of 1 in 3000. I use iodine and earbolie acid solution, and in the majority of cases that is all that is neeessary. I have had experience in two endemics of puerperal fever, one when I first began to praetiee and one about three years ago. The eases were bad ones to deal with. These eases have deposits of a diphtheritic-like looking membrane all over the eervix and vagina, and will extend over the vulva if you are not thorough in your work of removing it, keeping at it all the time. If you introduce your finger into the uterus, and at the plaeental site find it is hard or indurated, if you scrape it off you will get a grayish deposit. The patient's temperature is tolerably high, and the pulse very rapid and weak. These eases do not occur so frequently as the other elass; but they are the elass of eases in whieh we do not notiee mueh improvement following our first treatment, but I believe they ean nearly all be cured by persistent effort.

Dr. Longyear mentioned a moment ago that it was neeessary to exercise a great deal of eare and to keep constantly working at these patients, keeping the uterus cleaned out all of the time. I have not been able to get very mueh permanent relief in dealing with these cases by any form of drainage. After the uterus is cleaned out it should be washed out, generally, first by a peroxide of hydrogen solution, then following that by a half gallon of 1 to 4000 bichloride solution, then drying it and applying carbolie acid and iodine onee a day, or a 20 per eent. solution of nitrate of silver, but this not, of course, so frequently. If you do not wash the uterus out three or four times a day the temperature rises, and symptoms of sepsis and local extension of the infeetion manifest themselves. I have treated about ten patients in whieh there was mixed infection. This was some time ago, and the

examinations were not perfect. However, streptococci and staphylococci were found. In all of them I washed out the uterus two or three times a day, using various methods or agents, and among them permanganate of potassium. I also put in drainage-tubes and tried to establish efficient drainage. I packed the uterus with iodoform gauze, as well as with bichloride gauze. These ten patients were sick for a long time, and I had to work at them from a week to ten days, cleaning out the uterus in some cases several times a day. Four or five patients looked as though they would die in spite of everything, but by persistent and careful treatment they all finally got well.

In my early practice I had a series of cases of puerperal fever, when I did not try the plan I have outlined, but simply used carbolic acid and internal medication. The cases looked very much alike, and they died. Since I have adopted the plan of watching the local infection, where the membrane covers over the cervix and vagina, and resorting to different applications, I have gotten good results. I manage these cases better now than I did formerly.

I may be wrong, but I think these deposits should be cleaned off. I find that if they are left they get deeper and deeper, and then if you scrape them off bleeding will occur. They should be cleaned off, in the first place, in order to prevent a recurrence. I have tried various remedies with which to do this, and I think the best one for destroying the local patches or deposits when extensive, after scraping them off, is a pledget of cotton saturated with bichloride solution. Then I apply a 20 per cent. solution of nitrate of silver over the surface. This prevents a return of the local deposit. It is the best remedy I know of to prevent recurrence of the local infection. The iodine and carbolic acid is the next best remedy for local application in cases of this kind. In the uterus I use iodine and carbolic acid quite extensively. It has been my experience that drainage in these cases does not accomplish the purpose we desire. If we treat them persistently and perseveringly, I believe we can cure nearly all of them by resorting to the applications I have mentioned.

Dr. Duff.—It would be particularly interesting to know the cause of the "epidemics" to which Dr. Branham alludes.

Dr. Branham.—I did not go into the causation of the epidemics. I took charge of the hospital at the time the disease was endemic, and before I was able to stamp it out I had ten cases, all of which got well. The first epidemic occurred about sixteen years ago. I have seen cases of puerperal infection in private practice from time to time, but these ten cases of severe infection occurred in the hospital before I could stamp out the disease. There has never been a case there since.

Dr. Joseph Hoffman, of Philadelphia.—There are two ways of looking at this subject, and first from an obstetrical point of view. It is very remarkable to me that most of these cases of virulent infection are reported from the leading hospitals; that is, they start from there. In the first place, we will get reports from these hospitals showing a mortality almost *nil*. The next thing we get a report as to how efficacious curetting is in septic cases from these same hospitals. In a subsequent report we are told that two or three of the cases died of tetanus in one of our no-death hospitals. Gentlemen, there is something wrong. A hospital that has no sepsis needs no curetting. Still, we get our directions for curetting from the hospitals. A private practitioner has no deaths from tetanus—at least, we never hear of them; but still we get such reports regarding tetanus from hospitals. This is not ideal obstetrics. If no deaths, no curettement, no tetanus. Here we have all directions for asepsis and antisepsis. What does it amount to if you have antisepsis and no bad results? There is too much curettement. I simply want to get at the horns of this dilemma. There is a screw loose somewhere. If antisepsis is going to prevent all this trouble, why does it not do it? If it does not do it, why not say so? They are teaching nothing; they are giving us nothing. If an obstetrician goes into an ordinary obstetrical case clean, it seems to me there is no need for antiseptics. Therefore, I take it that in ninety-nine cases out of every hundred in our hospitals, or in any place where we have a case of sepsis, the obstetrician is back of it. There may be an escape of pus from a pre-existing pus-tube, but that is an accident. In the ordinary obstetrical case in which sepsis occurs, the obstetrician is back of it, and some of his meddlesome antiseptics are just as bad as any dirt he could possibly introduce.

So far as curetting and tamponing the uterus are concerned, I want you to look carefully into the matter. I want every abdominal surgeon here to consider if it is necessary to use so many antiseptics and to curette the uterus after labor. With reference to the application of carbolic acid, I had a little experience with it about two weeks ago. I had a bad tooth, and carbolic acid was applied to cleanse the cavity in the mouth. The mouth is an open cavity, and the mucous membrane of the mouth is accessible to the air and to irritating influences. For two weeks there was contraction in the corner of my mouth, so that I could not open it. Now, if carbolic acid will act this way on a mucous membrane which is normally exposed, what will it do on a sensitive mucous membrane connected with the peritoneal cavity? Are the mucous membranes alike?

I should like the President to enter this discussion, and tell us in the

many hundreds of cases of delivery he has handled how many cases there were of normal delivery; how many cases of curettement he has done after labor; how often he has found intrauterine douching necessary, etc. So far as I am personally concerned, I have never had but one death, so far as I remember, after labor, and I did not curette the uterus, did not make intrauterine applications, and I did not have sepsis.

Dr. D. Tod Gilliam, of Columbus.—There is one phase of the subject which I think has not been touched upon—namely, that the endometrium is not a mucous membrane, but a glandular structure; that the uterus is one of the natural drainage organs of the body; that the tendency of things is to go out of the uterus instead of going into the system from the uterus. In the great majority of cases the uterus, if left alone, will clear itself, and I fear with the application of caustics there is a tendency to seal up the uterus. An established practice is hard to get away from, and the application of caustics to the endometrium with or without curettage is one of these. I think the day will come when we shall cease to varnish the endometrium, and give nature a chance. As to the curette, I never use one in puerperal cases where it is possible to use the finger-nail. With the finger-nail I can remove all *débris* from the uterine cavity without danger to friable walls.

Dr. Albert Goldspohn, of Chicago.—It is painful to me to listen to such conflicting arguments, to such differences of opinion as have been expressed by Dr. Longyear and Dr. Dorsett upon a subject which is one of the greatest importance, of everyday occurrence, and ought to be a, b, c, not simply with this body, but with the general practitioner. How can we expect the general practitioner to have an intelligent idea of the treatment of puerperal infection if we make such a grand display of disagreement? The way to choose correctly in therapeutics is to recognize the pathological anatomy rightly. In other departments of medicine we recognize the difference between a syphilitic ulcer and a carcinomatous one, and the difference in therapeutics is self-evident to all of us. But in this department of medicine, I am sorry to say, many practitioners fail to make such a distinction. The distinction I refer to is the difference between the puerperal uterus and the gynecological or non-puerperal uterus. The treatment under discussion is that adapted to the puerperal uterus, and it has in the main been correctly outlined in Dr. Longyear's paper as well as by a number of gentlemen who have discussed it. The treatment, however, suggested by Dr. Dorsett is for the non-puerperal uterus. If anyone has any doubt in regard to the composition of these uteri, let him take an

extirpated uterus with beginning carcinoma and examine the thickuess of its walls, its consistence, the smoothness of its interior, and the nature of its lining. It is very much like the wall of a room covered with velvet. I need a sharp spoon to remove its lining. Let the surgeou then take the puerperal uterus. He will find it more like a rather thick rubber ball, lined with sheepskin, large enough to line a ball two or three times as large. This exteusive lining in the course of a few days is not involuted, but crimpled up within a smaller cavity. Anyone scraping such a uterus would not kuow whether it was the little vestige of secuudine or fold of mucous membrane that he was dealing with. Scraping a uterus like that with a sharp curette, unless it be very large, is much like raking a sheepskiu with a button-hook. Furrows for infection are the result, and little objectionable matter is removed. The sharp curette is rarely indicated in the puerperal uterus, but a non-cutting fenestrated curette forceps is the thing *par excellence*, as has been correctly put by Dr. Longyear and by that eminent teacher, Dr. Emmet. I have declared month after month that the Emmet curette forceps is worth its weight in gold, and I would have it constructed in the manner indicated by Dr. Reed. These are minor matters. We need to determine first the correct pathological anatomy, know the nature of the walls of the cavity we are tryiug to clean, and of its lining. The principle of cleaning out the puerperal uterus is to remove that which stands in relief on its inner surface, and not to dig *into* the surface, not to rake up the carpet in a room, so to speak, but simply to remove the chairs, etc., from the room, but not disturb the carpet.

After that, rely on daily intrauterine irrigation under low pressure with a thoroughly potent antiseptic solution of some kind, as 3 to 5 per cent. solution of lysol, 5 per cent. carbolic acid, or 1 to 2000 sublimate. But *never a drachm* of auy liquid should be injected unless the return curreut be amply secured by ample dilatation of the cervical canal, and also by one of the best double current douche tubes, and all air be carefully excluded.

Dr. Walter P. Manton, of Detroit.—I want to say a word or two ou this subject. I am a believer in the curette. When Dr. Longyear first brought out his instrument I procured one, and have had it iu my case ever since, and I consider it a valuable instrument. I do not take much stock in forceps, as a rule, but I have used Dr. Longyear's with excellent results. The man who cannot use a sharp curette in a puerperal uterus without scraping and gouging, cannot practice obstetrics successfully, especially if he is called upon to use such an instrument as this. The careful application of the sharp curette is, in

my experience, exceedingly useful. I am sure that I have saved lives by its use where other methods had failed, where the uterus had been repeatedly douched with antiseptics, and still the patient was slowly dying. We must make a distinction between the condition of so-called sapremia and septicemia. In a case of septicemia it may not be advisable to curette the uterus. It must depend wholly upon the case. In a case of sapremia in which the infection is poured out in small quantities and at intervals into the circulation from a decomposing mass or point in the uterus, the curette, in my experience, is always useful.

A year ago, before this Association, I advocated packing the uterus with gauze after the use of the curette. I was perhaps misunderstood at the time. I did not mean that the uterus should be packed tightly, but loosely *filled* with the gauze, and the gauze brought out at the external os. At the last meeting of the Michigan State Medical Society a general practitioner, who has had, according to his own statements, more cases of abortion to treat than any other man in the State, criticised my method and dwelt upon the necessity of strict asepticism. In treating these cases he carries a narrow strip of gauze up to the fundus uteri, bringing it out at the introitus vaginæ. Anybody who knows anything about bacteriology knows that the microorganisms which produce septicemia, pyemia, and so on, are more numerous at the external orifice of the vaginal canal than they are higher up, and that bringing the intrauterine packing to the surface of the body is not an aseptic practice. Dr. Dorsett made a similar statement regarding the use of the gauze; I do not think he intended to say that he brought the gauze uterine packing to and out of the vaginal outlet.

The discussion has wandered wide from the point of the paper. As I understand it, Dr. Longyear's idea was to emphasize the antitoxin treatment in cases of puerperal infection. I have had no experience in this method myself, except that the first three cases reported by the doctor occurred during my service at the Woman's Hospital last year. I was laid up with an attack of grip at the time, and Drs. Longyear and Carstens kindly looked after the patients while I was disabled. When I returned one of the patients had already died, the other was *in extremis*, and the third case, the first to develop the infection in which the antitoxin treatment was tried, recovered. I have been a little skeptical in regard to its use. The remarkable fall in temperature which Dr. Longyear notes I have seen occur in other cases where the antitoxin was not used. I hope that in the course of this discussion some unanimity of opinion in regard to the treatment of these cases will be arrived at. There is too wide a diversion of opinion.

These Transactions are published, go out, and are largely read, and I think the general profession may entertain wrong ideas as to the standard of the different members of this Association on the subject.

Dr. Dorsett.—I hope none of the members thought I would curette the puerperal uterus all the way around. As might be inferred from the previous remarks, I claim this: that if we have a piece of placental tissue attached tightly to the wall of the uterus, we cannot remove it with a dull curette; that it is necessary to have some sort of an instrument to get behind it in order that the tissue may be curled up, and take hold of it and peel it out in that way. I stand on the same ground that I did a year ago at the Chicago meeting—that it is necessary to have some sort of an instrument with a thin edge, set at a proper angle to the uterine wall, as well as to the proper angle to the handle of the instrument itself, and with which you can get behind the retained placenta and withdraw it. When you have gone through a friable and necrotic placenta with such an instrument, you will have no trouble in cleaning out the *débris*. I claim that this cannot be done with a dull instrument, the opinion of others to the contrary notwithstanding. By the use of the dull curette you simply rub septic material into the uterus. And if good results have been obtained after its use, it has been by the washing out or drainage, and not by the dull curette.

Dr. A. B. Miller, of Syracuse.—Each year puerperal infection comes up for discussion, and there is great difference of opinion among the members as to the best method of treatment. Each relates his experience of many years' practice regardless of the fact that until recently the true causation was not known. Dr. Longyear based his paper upon a pathological condition induced by infection. Dr. Goldspohn in his discussion so considered it. For our present knowledge of this pathological condition we are indebted to the bacteriologists. If true puerperal sepsis is due to streptococcus infection, it must of necessity mean that the infection must have been introduced into the birth-canal from the outside, either by the accoucheur himself by instruments, or some other source. Somewhere along the birth-canal there may be a laceration, and it is simply a struggle, after the canal has become infected, between the germs of infection and the reparative processes of the tissues along the tract, whether it be the vagina or the uterus. The discussion has been largely confined to infection of the uterine body itself. I believe, as has been stated by one gentleman (Dr. Gilliam), that the endometrium is a glandular organ, and that the uterus will ordinarily take care of itself if we take care of infection of the birth-canal below.

As a matter of preventive medicine, it is our duty to determine the means by which this condition can be arrested before it becomes necessary to resort to measures to overcome the systemic infection. If we are unable to determine the cause of the infection, we should submit the lochia to a bacteriologist for examination; then we will know whether we are dealing with a true infection caused by the streptococcus or a mixed infection as the result of streptococcus and staphylococcus, the gonococcus, or whatever it may be. If we have an infection arising from the streptococcus, unless it is arrested at the start, it enters the tissues, and it is impossible to arrest its further spread by the treatment of the past.

I am surprised at the gentleman who advocated the introduction of iodoform into the uterine cavity to arrest the spread of the infection. We are taught that iodoform has antiseptic properties, also that it will sustain the life of germs longer. If we are treating a surgical affection, why not do so surgically?

About a year ago I presented a paper in which I advocated the use of dressings of iodoform gauze or plain sterilized gauze. I prefer the latter. The iodoform gauze was sterilized and introduced into the birth-canal. These dressings were removed sufficiently often to take up the secretions. I did not introduce the gauze as a packing to retain the secretions in the birth-canal, but allowed it to remain sufficiently long to become saturated, and as soon as it is saturated the symptoms attending such a condition are apparent and the dressings are removed. As a result of this treatment, continued for one or two days, my cases have recovered.

We find in examining pathological uteri after death from puerperal infection, that they are rotten at the cervical portion. The uterus is not softened at the fundus.

THE PRESIDENT.—The preceding speakers have alluded to the importance of a consensus of opinion in our medical societies. Nothing but confusion and chaos go to the general profession in a discussion of this character. They look to us for light, and we should give it.

With reference to maternity hospitals, years ago the reports that came from these places showed a mortality almost *nil*. A little later a paper is presented by someone on curettement with gauze drainage of the uterus for puerperal sepsis, and the cases referred to by those discussing the papers are contradictory of the first report which showed a *nil* mortality. Years ago, when maternities were overhauled, the work was done beautifully, but there was less meddlesome midwifery then than now. Now, we have reports showing a high mortality, and

I am satisfied that the obstetrician is responsible for sepsis and death in many cases.

Dr. Longyear (closing the discussion).—Dr. Reed in his remarks spoke about the catch on the forceps. The object of that catch is to hold the forceps closed while being introduced. I place my finger against the cervix, and run it in as I would a sound. The catch is so placed that it will not hold while the forceps is closed gently upon anything which it grasps. It should not be locked in the uterus and then pulled out. He spoke also of the similarity between this and the Emmett curette-forceps. The principle is altogether different. They are considerably larger, the jaws are curved on the edge to facilitate entrance into a flexed uterus, and the shanks cross each other just back of the jaws, which permits free opening of them through a small os. Dr. Reed also spoke of the arms of the tubes causing irritation. The point is well taken. That may occur, as with any intra-urteine instrument, if the patient is up and moving about; but while she is quiet in bed there is no danger from that source. I have not seen any trouble from it.

Dr. Dorsett has mistaken the object for which this instrument was devised. It is not made to use, although it can be used, in a largely dilated uterus. When the uterus is dilated sufficiently to use the large placental forceps, you can almost introduce your hand, and can easily use your fingers. These large, clumsy placenta forceps are useful in about one in forty cases of retained placenta. I wish to avoid trauma by the use of this instrument. I do not usually calculate to remove placentæ *en masse* with this forceps. My idea is to remove, through a slightly dilated os, small particles with it, until the uterus is completely emptied. I removed, in this manner, a placenta in one case of five months with this instrument, and did it in fifteen minutes. The os was small, but I had no trouble. It is especially useful where we have hemorrhage, a small os, and would ordinarily tampon.

I think Dr. Dorsett confounded nuclein with antitoxin when he spoke of not finding antitoxin in the liquid form. I do not know of any antitoxin that is prepared dry, but it is the nuclein that is made in both the dry and fluid forms.

Dr. Duff spoke about the danger of injuring the endometrium with this instrument if passed close to the fundus. Such an accident could only result from its careless use. The edges of the jaws are bevelled off and smoothed, and made so purposely to prevent such injuries.

Dr. Branham spoke of removing the exudate membranes, not scraping them off with an instrument, but removing them by chemical applications. That is the point that I make. They should not be

scraped off with an instrument any more than we would scrape off a membrane in a case of diphtheria of the pharynx. The frequent application of peroxide of hydrogen will dissolve the membranes when they are situated where frequent applications can be made. In the vaginal canal it can be done very effectually.

Dr. Hoffman made the same point I did, that prevention is of the first importance. The important point in active treatment is to use those methods which will make the least possible irritation and accomplish the desired result.

Dr. Goldspohn's differentiation regarding the condition of the uterus to be operated on was excellent. It is one that I think should be emphasized—namely, the difference between puerperal uterus and the gynecologic uterus. Granulations scraped from the non-puerperal organ leave a smooth, firm surface, and for that reason a sharp curette should be used in such cases, but avoided in the puerperal uterus, as it presents altogether a different surface; being rough, soft, and spongy, we are very apt to injure it with a sharp curette.

ATRESIA, WITH RETENTION OF THE MENSES. TREATMENT.

By WILLIAM H. MYERS, M.D.,
FORT WAYNE.

With our newer apprehensions of the supernatural we do not now consider the God of the Jew and the Christian, nor the Satan of the Old Testament nor the evil spirits of the New, nor the stars of the midnight sky as the causes of the deformities with which an infant might come into the world. The gods were amusing themselves, the ancients said, when an infant was born with atresia of the vagina; others said they were angry with men, they were warning mankind.

In ancient Babylonia the birth of an infant of doubtful sex meant an approaching calamity, while the appearance of one with imperforate anus proclaimed famine; sometimes it was regarded as a punishment.

"Master, who did sin, this man or his parents, that he was born blind?" was the question submitted to Christ by His disciples.

"The fault, dear Brutus, is not in our stars, but in ourselves." I will not pursue this part of the subject any further, only to remark that it would be of interest, if time permitted, to trace through the centuries the various phases which the theories have assumed; the physical causes, the mental influences, and the theological dicta found in the literature of the past. To show the belief in the mental influences, even in the earlier years of the eighteenth century, I will offer one quotation from Duttel: "So great is the sympathy between mothers and the offspring which they carry in the uterus that they suffer closely with them to such an extent that not only are the delicate fibrillæ of the infants excited to anomalous movements by every severe affection of the mind of the mother, but, what is more, the formation of parts is altogether prevented, disturbed, or vitiated by the strong imagination of the mind."

This belief at the close of the eighteenth century is verified by the fact that a money value of a maternal impression of a patriotic kind was fixed at 400 francs per annum. Geoffry Saint Hilaire records that in the third year of the French Republic an infant was born with the representation of a phrygian cap of liberty on the left breast, and to the mother the government awarded the above sum, presumably for patriotism. Having thus alluded to the opinions of the ancients, I will now present the most recent opinion expressed by Pozzi, who asks: "What is the initial cause of anomalies in the genital organs? Is it arrest of development, or shall we suppose a higher cause, namely, atavism, reproducing sporadically in one species the form of some other by the effect of what Darwin terms reversion?"

This author believes the immediate cause, the anatomical condition of the malformation in the great majority of cases, is a simple arrest of development in the morphological evolution or the organic growths of the parts. He adds: "There are cases which we can explain only by supposing that there is a pathological process which has produced adhesions during the period of fetal life."

The causes of retention of menstrual blood within the uterine cavity are either congenital or accidental. The anatomical localization of the obstruction varies in its seat, depending upon atresia in the vulva, vagina, or uterus. The first is always cicatricial; the vaginal is simple when limited to the genital canal; complicated when it involves the cervix. In uterine atresia there is imperforation of the cervix, and it may even be obliterated.

I shall limit this thesis to that fortunately rare congenital malformation presented in cases of entire or partial absence of the vagina, incapacitating the patient for marital life and subjecting her to great physical suffering and danger. In referring to the current medical literature it would seem that this subject has been unduly neglected. It was frequently referred to by the older writers, and they invariably alluded to the inadmissibility of reparative treatment. Davis, referring to this condition, says: "One of the most remarkable instances of nature's wanderings from her accustomed laws is that which consists in the entire absence of the vagina." Blundel asserts that when the closure of the genital passage reaches throughout the whole extent the case scarcely admits of a remedy. The late Dr. Marion Sims says: "I have seen five

cases of congenital absence of the vagina, and in all of them there was no uterus." Dr. McNaughton Jones's experience agrees with that of Dr. Sims. Thomas A. Emmet reports seven cases of congenital absence of the vagina which passed under his observation; six with entire absence and one with a transverse septum about one inch from the outlet.

There existed retained menstruation in two cases where the vagina was wanting, and in the third case where the septum acted as the obstruction. Not the slightest vestige of the uterus could be detected in the remaining three cases of absence of the vagina. Emmet's experience coincides with the observations of Courty that atresia of the vagina may coexist with the absence of the uterus or with a normal uterus.

Cook, Netherdorf, and Bernay have recorded cases of congenital vaginal atresia. Pinch states that more than one hundred cases of this anomaly have coexisted with anomalies of the uterus; less than fifteen have been reported with a normal uterus. Schroeder reports unilateral hematometra with duplication of the genital canal; eleven cases of uterine atresia, twelve cases of superior or middle vaginal atresia, and five cases of inferior vaginal atresia. The number reported has led him to remark that this affection is not an extremely rare one.

The history as related in the books is usually as follows: A young girl has reached and passed puberty and has not menstruated. Her physical development is complete; at times, perhaps every month, pains in the iliac fossæ are felt, presenting all the rational signs of approaching menstruation. After a few days these symptoms subside, and the patient is left to an interval of comparative ease. Her general health begins to suffer after frequent repetitions of the above symptoms. The periodicity, the amenorrhea, and the frequent complications, often with evidences of local peritonitis, lead the attending physician to feel compelled to ascertain if possible whether or not there exists retention of the menstrual blood. He discovers there is secretion, but not excretion. Menstruation is non-apparent, but it exists concealed, and he must now ascertain if the retention results from imperforate hymen or congenital absence of the vagina.

The enlargement of the abdomen dependent upon distention of the uterus may have excited suspicions of pregnancy; this is elimi-

nated, for the enlargement has extended beyond the normal period of gestation. The essential fact is the presence of the menstrual fluid in the uterus or the vagina. In the case alluded to the ovaries are active, and the result is the responsive activity of the uterus and the presence of the menstrual blood.

Grailly Hewitt tersely states that there are two classes of cases to be dealt with: First, those in which the absence of the vagina is accompanied with signs of menstrual retention; and, second, those in which no signs of menstrual retention are apparent. The practical deductions are that in the first class operative measures are called for, while in the second class this is not necessarily the case. The diagnosis in the latter class of cases is not to be based upon any relation existing between the development of the external and internal sexual organs, but the uterus and its appendages can be easily mapped out under chloroform by a conjoint recto-abdominal bimanual exploration.

If the uterus is absent, the woman married, should the formation of an artificial vagina ever be attempted? Edis answers affirmatively. The late Dr. Gross said: "Nothing is to be done. The woman is impotent, and therefore disqualified for marriage." Ashhurst holds the same opinion. Leverat calls it an operation of *complaisance*.

Dr. Emmet holds that if the vagina be absent it is proper to open a canal at an early age if no retention exists, if a vestige of the uterus can be detected. Several years ago a Mrs. M——, aged twenty-four years, was brought to me by her husband. Upon examination I found an entire absence of the vagina and uterus. Her husband was anxious that if possible some surgical procedure should be resorted to. She was well developed, of splendid physique, and very handsome. In compliance with his wish an operation was performed. I was assisted by Drs. McCausland and Porter. During anesthesia she was placed in the usual lithotomy position, a sound introduced into the bladder; with my left index-finger in the rectum I carefully dissected between the rectum and bladder to the depth of my index-finger and dilated by tearing up intervening tissue. The operation was completed in one sitting; the tissues were broken up or lacerated, believing that the contraction would be much less than when divided by the knife or scissors, remembering that contraction is so apt to ensue. The

passage was made much larger than necessary. She made a good recovery from the operation, and I advised her to wear a Sims dilator. The operation was successful. The dilator was worn as directed, and I tried to assure myself that

"The winter of their discontent would be made glorious summer . . .'

and

"All the clouds that lowered upon that house
In the deep bosom of the ocean buried."

But her liege lord had acquired, in the meantime, a knowledge of the medico-legal relation of the subject, namely, that sexual malformation, involving impotency, constitutes one of the canonical impediments to marriage, and if contracted by a person laboring under such malformation the contract is voidable.

Case II.—Mrs. R., married, aged twenty-four years; height five feet four inches; weight ninety-three pounds at the time she was received at the St. Joseph's Hospital. She had one sister who began to menstruate at the age of seventeen years and her mother at the age of eighteen. At sixteen she felt symptoms which were referred to approaching menstruation.

This operation was performed on March 9, 1896. She left the hospital April 27, 1896. At this time she felt some uterine pain and also pain in the back. These increased in intensity for one week, and then subsided entirely. In four or five weeks they recurred, and she experienced some enlargement in the lower part of the abdomen. She had never noticed any discoloration of blood about the pudenda nor any trace of menstrual blood. An examination revealed an unusual condition. The external organs were well developed. There was no vagina. The urethra was dilated, admitting the point of the finger. *Examination per anum* about two inches up the finger came across a tumor about the size of a child's head, fluctuating. Bimanual examination made it to play between the rectum and the finger two inches above the pubes. The atresia of the vagina was complete. Dr. Morgan, of Dixon, Ohio, had been her attending physician. His diagnosis had been verified by me. He readily acquiesced that an operation should immediately be done, as she was suffering great pain and the distention distressed her greatly—more than at any previous time. To this she readily consented. I adopted A——'s operation, first

performed by him in the year 1832. She was anesthetized, placed in a proper position, sound introduced into the bladder. I made a transverse incision between the meatus urinarius and the anus, and, with right forefinger and sinus forceps and blunt-pointed scissors, I tore up the connective tissue in the median line. This incision was continued until the uterine wall was reached at a depth corresponding to the length of the index-finger.

I then punctured the uterine wall with a large-size trocar and immediately enlarged the orifice with a blunt-pointed bistoury. Fluid was allowed to escape rapidly; sixty ounces at least were discharged—a dark-brown liquid of the consistency of tar. I could not detect by touch nor by the use of the speculum the presence of the cervix. The treatment now consisted in the daily washing out of the uterine cavity with hot water and boric acid, using for this purpose the Thomas intrauterine nozzle attached to a fountain syringe. Light packing gauze for a few days. The temperature ranged from 102° to 103°, with a pulse of 115 for four days. The tendency to contraction was overcome by using a horseshoe pessary of ordinary size. It was easily inserted and retained. In five weeks menstruation occurred, and has returned regularly at the usual period.

Conclusions. I believe that in a case of atresia of the vagina with retention of menstrual fluid in the uterus an operation ought to be completed at one sitting, adopting the direct method. I think the teaching in a recent work that "the best way is to make a small opening into the mass and allow the contents to flow away gradually is not sound." I cannot, therefore, see in rapid evacuation the great dangers referred to in the books.

SOME CAUSES OF INSANITY IN WOMEN.

By GEORGE H. ROHÉ, M.D.,
SYKESVILLE.

The general causes of insanity are the same in women as in men. Sex, irrespective of other modifying conditions, has probably little influence upon the causation of insanity or upon the form of the mental disturbance. But there are differences in the life-history of men and women which exercise a decided influence upon the causation of mental disturbances in the two sexes. Thus, general paresis and the insanities following over-indulgence in alcohol are almost limited to men, although observed in women exposed to the causes producing these diseases in the other sex. Hysterical insanity is rare in men, frequent in women; neurasthenic mental disturbances and the insanities following the abuse of opium and other drugs are found in nearly equal proportion in both sexes, while it is self-evident that menstrual, puerperal, lactational, and climacteric insanities are found only in women.

It will be seen, therefore, that, in those forms of insanity in which the causes can act on both sexes alike, the relative frequency of the mental disturbances in the two sexes is determined by the intensity or extent of exposure to the exciting causes. On the other hand, there are certain forms of insanity which are found only in women, because dependent upon causes inherent in the sexual life of women.

Women are especially subject to mental disturbances dependent upon their sexual nature at three different epochs of life: the period of puberty when the menstrual function is established, the child-bearing period, and the menopause. The insanities occurring at these periods, and coincident with the functions and activities peculiar to them, have an intimate etiological relation with these functions and activities.

At the period of puberty, when the boy and girl are passing through the phases of sexual transformation, mental disturbances

in both sexes are not infrequent. It has been noticed, however, that while in the pubescent insanity in boys the form of mental disorder is generally depressive, in girls it is more likely to be maniacal and paroxysmal. Shouting, laughing, indecent and erotic manifestations, and convulsive seizures are frequent. The so-called "hysterical" element is so frequent in the pubescent insanity of females that it almost stamps it with its characteristics. The periods of greatest excitement usually correspond with the menstrual molimina. Menstruation is frequently absent, or irregular and painful; and it has often been found that as soon as the flow becomes regular, free, and painless, whether as a consequence of treatment or otherwise, the mental disturbances disappear. In some cases the girl is insane only during the menstrual period, speech and conduct being perfectly normal during the interval.

I believe that in the majority of such cases there are pathological conditions of the pelvic organs which, if corrected, will result in rapid and permanent improvement of the psychical condition. The abnormality may be in the uterus, tubes, or ovaries, which should in all cases be subjected to a thorough physical examination. Not a few cases have been recorded where no abnormality of these organs could be detected, and yet in which the artificial establishment of the menopause, by removal of the appendages, has been followed by complete mental restoration.

A large proportion of the cases which we call hysteria and hystero-epilepsy, after a time become insane and end their existence in insane hospitals. If such cases were more carefully studied by the physician it would be found that some organic affection preceded and probably caused the neurotic manifestations. To the family physician hysteria is too often a disorder of the imagination, and in this opinion he is generally supported by the neurologist, who looks upon hysteria as a pure psychosis. Sometimes the latter will allow to traumatisms or exhausting diseases a causative relation to hysteria, but it is generally considered so improbable that the reproductive organs can have anything to do with the hysteria that in the physical examination these organs are absolutely ignored.

In spite of the prevalent belief that hysteria is primarily psychical, I am convinced by observation that hysteria has in the large majority of cases a physical cause. This is not necessarily

a disease of the uterus or ovaries, because men sometimes have hysteria. Traumatisms or acute or chronic disease anywhere in the body may cause hysteria. Many people inherit a nervous organization incapable of resisting stresses of any kind. These individuals become hysterical on slight provocation, but in many cases careful observation and inquiry can trace the precedent physical shock or stress. That women suffer more frequently and more acutely from hysteria is probably explicable by their naturally more excitable and less resistive nervous organization. Babinski has written an interesting paper in which he reports a series of cases in which the hysteria was associated with organic diseases. Among these were organic spastic hemiplegia, diffuse meningo-encephalitis, traumatic facial paralysis, peripheral neuritis, purulent cystitis, cervical endometritis, organic coxalgia, and periarthritis of the shoulder-joint. I can add from my own observation one case of spinal caries, one of hematoma of the ovaries, one of extensive laceration of the cervix, and several of displaced and adherent uterus and ovaries. In some of these cases prompt surgical interference resulted in a cure of the hysteria. In others, in which this was refused or too long delayed, the hysterical condition persists. I am convinced that earlier attention to the physical condition in these cases would be more frequently followed by favorable results.

During the childbearing period, gestational, puerperal, and lactational insanity are frequent. About 10 per cent. of all cases of insanity in women are classed among these three forms of mental disturbance. The specific causes of gestational insanity are not well understood. In two cases that have come under my observation there was laceration of the cervix. In one the repair of the laceration was followed by mental recovery. In the other, in which no operation was permitted, the mental disorder—depression with suicidal tendency—became intensified, and the patient is now, a year after delivery, probably permanently insane.

There is very little room for doubt that puerperal insanity is often due to pathological conditions of the parturient canal favoring the absorption of septic materials. Hansen and Olshausen have furnished strong clinical evidence in support of this view, and modern writers upon insanity regard puerperal mania as an infection-psychosis. I am of the opinion that, while the primary cause is

infection, the results of pelvic inflammation—adhesion and displacement of uterus, tubes, and ovaries—are responsible for the continuance of the mental disturbance. This leads to the inquiry whether septic absorption in other conditions than puerperal or non-puerperal inflammatory diseases of the pelvic organs in women may give rise to insanity. While this has not been absolutely demonstrated, I do not hesitate to express my conviction that an affirmative answer is the true one.

Fibroid tumors, endometritis, inflammatory conditions of the pelvic peritoneum with their complications and consequences, pathological conditions of the ovaries and tubes, lacerations of the cervix and tears of the perineum, are all, in my opinion, occasional causes of insanity in women, and the periods when these conditions are most frequently met are those when insanity in women most frequently occurs. Furthermore, experience has shown that the discovery of local physical disease and its treatment has been followed by improvement and recovery in cases regarded as otherwise hopelessly insane.

The insanity occurring during the lactational period is not always due to physical exhaustion. In this form of mental disturbance septic absorption or peripheral irritation likewise stand in an etiological relation. I have notes of cases of insanity of the lactational period coincident with, and probably due to, mammary abscess, lacerated cervix, and retroverted uterus with adhesion. Defective uterine involution is also to be reckoned among the etiological factors of lactational insanity.

Puerperal eclampsia is sometimes followed by temporary or permanent mental disturbance. Here the mental impairment is probably due to the toxemia, although in some cases permanent structural alteration in the brain may have been produced by the convulsions.

During the climacteric period mental disorder, ranging from mild depression to the most exaggerated delusional states, is frequent. The milder nervous phenomena usually pass away in a few months, but the graver forms often eventuate in permanent mental alienation. Many of these patients refer their symptoms to present or past sexual disorders; and while these complaints are generally regarded as delusions, and doubtless often are so, only a physical examination can determine whether local disease is pres-

ent or not. I recall one case in which the patient's complaints of local symptoms were neglected for months until an examination, finally made, showed advanced cancer of the vagina. In another a mammary cancer was coincident with the development of the mental disorder; no improvement in the mental condition occurred until after extirpation of the affected breast. In the majority of cases of climacteric insanity, however, no physical disease can be detected. It is probable that the profound alterations of nutrition consequent upon the arrest of the menstrual discharge and the cessation of the childbearing function can be regarded as the prime factors in causation of the insanity of this period.

Insanity following operations upon the female pelvic organs may, I believe, often be classed with the cases of ordinary climacteric insanity. In those cases, however, where the outbreak is violent and comes on within a few days of the operation, we probably have to do with a septic delirium, which either passes off in a few days or leads to death from toxemia and exhaustion.

In this connection I want to call attention to the statement sometimes made of the great number of cases of insanity following gynecological operations. I do not believe the cases are so frequent as is claimed by some. A careful inquiry undertaken by me some years ago showed that comparatively few were admitted to insane hospitals, and of these about 25 per cent. recovered. I have personally seen only two cases. One of these was very mild, and recovered without going to a hospital, while the other developed the alcohol-habit after discharge from the hospital, and was some years later readmitted. This case was fairly typical of the depressive conditions so frequent in climacteric insanity.

I have had one case under observation which was at first believed to be due to the removal of the ovaries; at least I had been led to believe by the friends of the patient that this operation had been done upon her before the mental disturbance came on. The patient who was a very cultivated woman, was admitted in a very excited condition, with delusions of persecution. She charged her most intimate friends and relatives with attempting to poison her and defrauding her of her fortune. After a short time she became quiet and rational, and I then examined her physically. To my surprise, she had no scar upon the abdomen, and the uterus was normal in size and position. In reply to my questions she said she

had been operated upon by a distinguished New York gynecologist, but to the best of her knowledge her ovaries had not been removed. I then wrote to the operator she mentioned, who answered that the only operation he had performed was curettement of the uterus, and that the patient had left his charge perfectly recovered, having shown no sign of mental aberration while under his care. Further observation of the case showed that she was addicted to the use of morphine, a practice she had acquired some years before she came under my observation. In this case the statement of the friends of the patient had been so positive that insanity followed removal of the ovaries that, if I had not been careful to make a personal examination, it would have gone into my records as a case of insanity following oöphorectomy.

THE RELATION OF VISCERAL DISORDERS TO THE DELUSIONS OF THE INSANE.

By W. P. MANTON, M.D.,
DETROIT.

That the delusions of the insane are often an expression of somatic peripheral irritation has long been recognized, but observation leads me to believe that the importance of these mental manifestations as indices of bodily suffering is frequently ignored as a mere phase of the brain disorder, especially in the instance of supposed fancied visceral disturbances. It is quite true that, in a large percentage of those cases in which the absence or disease of some abdominal organ is the constant plaint of the mental invalid, the parts referred to are really in a fairly healthy condition, a faulty enervation being responsible for the distorted psychic impressions; but while many cases of delusion may thus be accounted for, there still remain a considerable number in which actual disease is present and renders the patient additionally miserable by keeping up a constant irritation of the cerebral cortex.

As no one, however, is sufficiently skilful to be always able to decide from the invalid's expressions whether there is a physical basis for the reiterated lamentations or not, it becomes the duty of the physician to determine the actual conditions present by a careful physical examination before putting the matter aside as the figment of a disordered mind.

For convenience of consideration the so-called visceral delusions may be placed in four classes:

1. Delusions arising *de novo* from the diseased activity of the brain.

2. Delusions regarding external or visible abnormal bodily conditions.

3. Delusions arising from easily determined visceral disorders; and

4. Delusions dependent upon obscure abdominal and pelvic states.

The last three classes will be briefly considered.

We can readily understand how visible bodily defects may be misinterpreted and the mind of the patient become confused as to the real nature of the condition, which is always more or less open to inspection. The sight of a desmoid tumor slowly developing in the abdominal walls led one of my patients to believe herself pregnant, but the removal of the growth soon dispelled the illusion. In another instance a uterine fibroid called out the same impression and the patient requested the physician to listen to "hear the young ones." The appearance of a complete procidentia uteri in another case gave rise to the idea that the protruding mass was the male organ, and under such conditions the patient could no longer retain her feminine appellation and immediately rechristened herself "John." Such examples might be multiplied, for they are of frequent observation by all who have to do with the insane. In such instances, as I have already remarked, the connection between the delusion and the somatic disorder is obvious, being, as it were, on the surface.

In the third class, however, the relation of the condition to the expressed idea is not always so apparent. Recently I had occasion to examine two sisters at the Eastern Michigan Asylum, each of whom, strangely enough, was possessed of the delusion that she was pregnant. Both women were found to be suffering from an endometritis.

Here the delusion evidently arose from the misinterpretation of the sense-impressions initiated by the inflamed uterine mucosa. Such delusions are of such common occurrence as to be usually considered of little moment, and are, therefore, completely ignored as signs of actual physical suffering. Contrary to the general opinion, I believe that in very many instances a careful physical examination in such cases will reveal the presence of some local disorder to account for the mental manifestations.

Regarding the fourth class of delusions much might be said. They arise from obscure abdominal and pelvic disorders which may or may not be discoverable during the patient's lifetime. The difficulties presented by such cases, therefore, should elicit our most careful consideration and study, and in occasional instances we are

likely to be rewarded by the discovery of the abnormal conditions which determine the delusions. Some years ago I operated on a middle-aged woman at the Eastern Michigan Asylum, who had passed for many years as a "sexual hypochondriac." From nearly the beginning of her insanity the local organs had figured largely in all her delusions. At the time of the operation the abdominal walls were so distended by ascitic fluid that examination to determine the cause of the condition was negative in result. A large multilocular ovarian cyst surrounded by much free fluid was discovered. The pain and irritation produced by the beginning of this growth were undoubtedly responsible for the form of this patient's delusions, which persisted for so many years.

In 1878 a male patient was admitted to the Eastern Michigan Asylum suffering from dementia monomania. He had accused his home physician of introducing a mouse into his stomach, and was accustomed to strike himself violently on the abdomen with the right hand. According to the report, "the blows were delivered with terrific force." A fistula in ano developed later, and the patient's urine contained albumin and hyaline casts. He died in 1884. At the autopsy the peritoneum was found to be thickened and showed evidences of old inflammation. The intestines were firmly matted together, and, in places, adherent to the abdominal wall. Evidences of recent peritonitis were present, and the peritoneum and intestines were covered with small tubercular masses of a grayish-white color. The great omentum had dwindled to a tongue-like mass one and a half inches wide at the middle and one-fourth of an inch thick, was as firm as muscular tissue, and extended diagonally across the abdomen from the greater curvature of the stomach to a spot opposite the anterior superior spine of the ilium, where it was *firmly united to the peritoneum of the abdominal wall.*

A male patient, aged thirty-eight years, with symptoms of chronic dementia, complained from time to time of visceral hallucinations. One day, while at work in the kitchen paring potatoes, he walked to the water-closet unattended, carrying the paring knife with him. A few minutes later he was discovered in the act of disemboweling himself, using the knife with both hands. The incision thus made was found to be about six inches in length and extended transversely across the abdomen about two inches below

Fig. 1

Fig. 2.

Fig. 3.

the ensiform cartilage. Further examination showed that *a portion of the omentum was firmly adherent to the anterior abdominal wall.* An opening had been made into the stomach large enough to admit two fingers, and there was a diagonal laceration of the stomach-wall four inches in length, extending through both the peritoneal and muscular coats (Figs. 1 and 2). The reason assigned by the patient for this self-inflicted mutilation was "to let the fellow out," and he thought he had "succeeded well."[1]

In 1895 an old woman suffering from chronic dementia, and whose constant plaint was the absence of bowels, the inability to digest food, and obstipation, broke the night vessel in her room and with a sharp fragment of the pottery made an incision through the abdominal wall near the median line. *The intestines were found to be inflamed and matted together by inflammatory product* (Fig. 3).

Other similar cases might be cited, but the four mentioned will suffice to illustrate the point which I wish to make.

In each of these patients the delusions referred chiefly to the abdomen, and in each an abnormal condition of some of the viscera was found, but a condition in which the early intervention of surgery would have afforded great, if not permanent, relief to the patient's sufferings.

With such facts, not theories, before us, it seems to me that abdominal section, in properly selected cases of the insane in whom visceral delusions are a pronounced and constant feature of the mental disorder, is not only justifiable but urgently demanded in the interests of the patient. For a number of years I have urged before this and other societies the importance of the amelioration of somatic disorders in the insane amenable to surgical treatment. At the same time I have always maintained, and never more strongly than today, a progressive conservatism toward operative interference in the instance of these helpless people committed to our care.

Therefore, in advocating so radical treatment in the class of cases to which I have just alluded, I desire not to be misunderstood. In my opinion, while such operations are sometimes clearly indicated, no such procedure should ever be undertaken by the

[1] Biennial Reports, Eastern Michigan Asylum.

surgeon without the concurrence of a competent alienist, and even then the abdomen in these cases should never be opened until the patient has been under observation for a length of time and subjected to most thorough, careful, and painstaking physical examination. The axiom, "If in doubt, operate," in this instance, if in no other, is a most pernicious rule to follow, and it is incumbent upon us as members of an honorable profession to see to it that surgery is not degraded by unwarrantable, venturesome, and foolhardy experiment.

OÖPHORECTOMY FOR THE INSANITY AND EPILEPSY OF THE FEMALE:

A Plea for Its More General Adoption.

By DAVID TOD GILLIAM, M.D.,
COLUMBUS.

In reopening this most important subject I shall not weary you with long dissertations, nor yet dwell on the ultra-scientific aspects of the case. I shall not deal with the subtle thoughts of the psychologist, nor avail myself of the fine distinctions of the alienist. I shall confine myself to plain facts and homely illustrations. I shall use the sexed and unsexed of man and beast, and the whole paraphernalia of old-time logic and literature. I shall use the clinical experiences of modern times. And, lastly, I shall startle you with a proposition that will, I fear, bring down on my head a storm of disapprobation. But here at the outset I wish to aver my seriousness and integrity of purpose, to disclaim any effort at sensationalism, and to proclaim my willingness to retract my utterances and to make all possible amends for the same if convinced of the error of my ways. Those who know me best and have followed me in my work can testify to my conservatism, to my aversion to operative interference where operation is not called for, to my utter abhorrence of depriving either man or woman of the God-given attributes that make them distinctive, unless the indications for the same are plain and palpable. I propose to show in this paper that oöphorectomy is a logical and legitimate operation for the epilepsy and insanity of the female.

I shall attempt to show that the ovaries are important factors in the processes of the economy, that they are capable of exerting a beneficial or baneful influence. I shall attempt to discover wherein this relationship exists, how far it extends, that we may deduce therefrom our line of treatment and gauge our expectations.

I will call your attention to the wonderful changes that attend the establishment of ovulation—the evolution of mind and body and moral sense. I should like to descant on these changes, to quote beautiful passages from some of our gifted writers with whom it seems to have been a favorite theme. I shall endeavor to show that this miracle of developmental energy is partly incident to, and partly coincident with, the evolution of the sexual apparatus. As the ovaries and testicles are analogous, I shall use one or the other as best suits my purpose to elucidate the question at issue. It would seem an easy matter to determine the effect of the sexual glands on the economy, as we are supplied with all the conditions both by nature and by art. If we take a girl in whom the ovaries are congenitally absent, we find an arrested development of both mind and body. Bust and hips are deficient, and she is wanting in the rounded outlines and beautiful curves of her more favored sister This is the usual picture, but here comes a query: Is the want of development *because* of the absence of the ovaries, or is the latter merely an expression of the general developmental atony?

Take the following: Four years ago I was consulted by a young lady of about twenty-two years. She was a rare beauty and of perfect form. She was bright and intelligent, and had always enjoyed the best of health. On examination I found the external organs of generation perfect; the clitoris was above the average in size. There was no vagina, and, so far as I could determine by careful examination, there was neither uterus nor ovaries. She said that she was passionate, that she wanted to marry, and had come to have a vagina constructed. She had never had vicarious menstruation nor experienced the menstrual molimen. The rest is not relevant, but I go on. I made a vagina ample and deep, and placed therein a glass plug, enjoining her to wear it almost constantly. I told her if it (the vagina) began to close up to come to me at once. She married. Eighteen months after she wrote to me, and, with the coyness peculiar to her sex, remarked: "My husband has said nothing about sending me to Columbus." This case would indicate that the ovaries are not essential to growth of mind or body. But let us look further. In the eunuch we find a person from whom the external organs of generation have been removed at an early period and before they could have much influence in shaping the destinies of developmental energy. Popular

opinion ascribes to the eunuch properties that are diametrical to manliness; according to this view he is puny, pusillanimous, effeminate, wanting in intelligence, despicable. In this opinion I find many of the profession sharing. Eunuchs are not common in this country, and we have few opportunities of verifying or disproving this view. History, however, is not silent. Time was when eunuchs abounded. The women of the harem were entrusted to their charge, to whom they had free access, with whom they commingled. By reason of this they were brought in contact with kings and courtiers, and enjoyed special privileges. That they were not wanting in intelligence is evidenced by the fact that many of them came to distinction in science, in literature, in statecraft. Some became rulers of realms. That they were not wanting in soldierly qualities it is only necessary to mention the name of Narses. We are told that in physique they were the equal of those around them. It is true that their voices were the voices of boys, but their ruling traits were fidelity, truthfulness, high moral sense.

Let us turn to the lower animals. Much has been said about the differences between the castrated and the intact animal, but when we come to analyze these differences we are surprised at the paucity of result. Not that a difference does not exist, but it confines itself to a much narrower limit than at first supposed. If I were to ask you wherein this difference consists you would reply: "Oh, the perfect male is superior in every way—he is larger, more muscular, fiercer, more majestic." But a moment's thought will convince you that the castrated animal may be, and often is, as large and as muscular. He is equally as sagacious and enduring. He is less majestic, less terrible, less impulsive. Why do we alter our colts and calves? Not that we expect to dwarf them, not that we expect to abate strength or endurance, nor yet to render them less intelligent; but that we may make them tractable and trustworthy—that we may convert them into faithful, well-disposed servants. The experience of ages sanctions the practice and puts the seal of truth on it. The combative disposition of males toward each other is notorious. The terrible combats of the stag and the stallion, the sonorous challenge of the bull as he roams the country over in quest of a female or a fight, attest the inherent tendency of the male. Instance: Two stallions are in the same stable, a

black and a bay. The black slips his halter and attacks the bay. The bay breaks loose and the combat wages furiously—so furiously and relentlessly that onlookers are powerless to interfere. The black, mangled and bleeding, sinks to the earth, and the bay pounces upon him with his feet and tears him with teeth until reduced to a pulp. The bay is horribly mutilated and is shot. A gelding will fight, a steer will fight, but they will not go after one; they will not pursue their victims through the gates. A eunuch will fight, but only in defence of person or principle. I have said that sexual fervor is a characteristic of the unmutilated male. I am not going to argue that the sexual sense is residual in the organs of generation. I am not going to argue that men or women bereft of these organs are wanting in sexual passion. I believe with many others that the seat of passion is located in the central nervous system. I believe that the fires of passion continue to burn even after the external organs have been removed. But they do not burn so fiercely, they do not lead to overt acts. It has been said that a steer will chase a cow. Possibly; but not with the vim and vigor of the bull, not with the determination that laughs at danger and recognizes no obstacle. That the perfect male is as valiant in love as in war the following will attest: A gentleman saw a cow standing at a fence on the hillside, looking over and down. A bull appears at the crest with fire in his eye; spying the cow he bounds toward her, gathering momentum with every jump. When twenty feet away he lifts himself in air and strikes the cow with terrific force. Both go through the fence and down the declivity. A period of quietude, and the bull struggles to his feet and assumes a professional air. But the cow—alas! in the language of the poet, "the subsequent proceedings interested her no more." That was all right for a bull, but such conduct on the part of a steer would be highly indecorous. The steer is not an ardent lover, and even the cow recognizes the fact. That the emasculated have sexual passion the behavior of animals and the testimony of man leave no doubt. But it is a passion tempered with prudence and tame beside the fierce energy of untethered masculinity. History, so far as I know, gives no instance of sexual perfidy on the part of the eunuch, and yet of all men his opportunities were greatest. If you ask me how the eunuch could betray his trust, I refer you to the sexual pervert. That the sex-

ual fires always burn, even in the breast of the so-called passionless I have had many occasions to verify. Women in the seventies will sometimes tell you, as they have told me, that they still retain much of the ardor of youth.

I know a woman of thirty-nine years who, notwithstanding that she has never in her life, with but two exceptions, experienced pleasurable intercourse, and to whom the act is uniformly painful, will solicit her husband for the marital embrace. Women are by nature more nearly neutral than men, and the deprivation of the sexual glands is less felt by them, and yet I have seen many instances in which castration has been followed by a marked change in disposition and temper, and always for the better.

A word more with reference to the influence of the sexual glands on mentality. When I began the preparation of this paper I was imbued with the idea that such a relationship existed. I believed that the sexually perfect man or woman gave us the highest type of mental vigor and energy. I called to mind many instances. I formulated the proposition that the aggressive and progressive in all the walks of life were men or women of the greatest sexual vigor—that the leaders were lovers in civil as in martial life. I then thought of Parvin, of Playfair, and of Price, and the absurdity of the thing overwhelmed me. Then I took the other horn of the dilemma. I was reminded that sexual excesses led to evil results to body and mind; that even a single ejaculation of the spermatic fluid was followed by lassitude and somnolence. I looked to the humbler walks of life and found mediocre intelligence and large families. I looked to the pinnacles and saw intellectual giants, grand and gloomy in their solitude. I said: "It is the equity of nature; procreative power and mental energy are inverse." But a wider ken brings such a multitude of exceptions as to disprove the rule, and we reach the climax when we find that idiots are deficient in both respects.

What, then, is the sum of the whole matter? Simply that castration changes the disposition and temper of animals and heightens the moral sense in man. Of this there can be no doubt. The whys and wherefores would make an interesting study; but the fact remains, and that is sufficient for the purpose. That there exists a correlation between the sexual glands and the mind I have little doubt, but in the present state of our knowledge we cannot put a

finger on it. I do not believe that Brown-Séquard was altogether dreaming when he promulgated the virtues of the seminal fluid. But the time is not ripe for a therapy grounded on such views. Let us turn to clinical experience. Some pioneer work has been done in this direction by men who have had the courage of their convictions. Rohé, Manton, and others have blazed the way; and what do they tell us? They tell us that castration pays; that patients are improved, some of them cured; that the moral sense of the patient is elevated, that she becomes tractable, orderly, industrious, and cleanly. This is *a priori* just what we would expect. It is just what we find in animals, in men and women upon whom the operation has been performed for other reasons. My own experience in this line has been most happy. But I forbear; enough is already known for the purpose.

I come now to the last, and, I think, the most important phase of the subject. I believe in the castration of epileptics and the insane. I believe in it on broad, humanitarian grounds. Insanity is hereditary. Epilepsy is hereditary. They constitute the greatest curse to humanity. An insane father or an insane mother will bring more misery into the world than any other father or mother. The offspring of such a parent when ushered into the world will be confronted by the awful spectre of impending doom, and though he call on the rocks or mountains to fall on him, or flee to the uttermost parts, the curse will pursue and overtake him. I give you a picture from real life. A young man of five and twenty meets and marries a young woman five years his junior. He is manly and intelligent, she brilliant and beautiful. Both are of excellent family, but on her side the neurotic element is strong, and can be traced through generations. In time a child is born—a boy. He grows in stature and in favor. He is sent to school. He outstrips all competitors. At the early age of sixteen he graduates, the admiration of the people, the pride of his parents. His mental prowess, his artistic accomplishments are phenomenal. "A glorious future awaits him." He begins to have queer spells. The doctor is consulted and pronounces it epilepsy. The paroxysms increase in number and severity. He has dangerous moods. In one of them he hurls a knife at his sister and inflicts a cruel wound. He is sent to the asylum. He goes from bad to worse, becomes a drivelling idiot, gives himself over to filthy and disgust-

ing practices. The father walks pensively from day to day. The mother wrings her hands and cries. He dies, and the shadow lifts. This is not an isolated case. Thousands of mothers all over this broad land are echoing the refrain of this mother. It is not the voice of Rachel lamenting her children. It is more like the cry of Tamar bewailing a cursed maternity.

The logical conclusion of all this is that every insane or epileptic, male or female, should be castrated; aye, more, any that have the insane or epileptic tendency. I am not prepared to go so far. I would limit the operation to those in whom the malady appears in some way to be connected with, or dependent on, sexual disturbance. I would go further and include all who are willing to undergo the operation to save themselves and their offspring from the miseries which await them. In this we need have no compunction, for, though the patient be not directly benefited, we feel that we have discharged a duty and conferred a boon.

MELANO-SARCOMA OF THE FEMALE URETHRA:

Urethrectomy; Recovery.

By CHARLES A. L. REED, M.D.,
CINCINNATI.

There is, I am sure, no occasion to apologize for bringing to the attention of the Association the details of a case of melano-sarcoma of the female urethra—a case which, so far as a reasonably comprehensive research of the literature indicates, is the first of the kind to be placed upon record. Sarcoma of even the ordinary varieties involving the urethra are exceedingly rare, there being, according to Ehrendorfer, but two upon record, viz., one by Biegel, in 1875, the other by Ehrendorfer himself, in 1892. In neither of these cases, however, were melanotic features the distinguishing characteristics. I mention this fact, not to emphasize my priority in either the observation or publication of this condition—a matter of no essential importance—but to indicate the extreme rarity of the condition manifested in the following case:

Mary E. Y., aged sixty-four years, single, was brought to my private hospital by her family physician, Dr. Joseph Morris, of Columbus Grove, O., December 3, 1895. The patient had had no serious previous illness. There was no history of tuberculosis or syphilis in her family. The virginal condition of the genitalia precluded the supposition of venereal infection of any character. Her general health was good, although there was some emaciation about the neck and breasts, the latter of which were flabby—changes no doubt incident to age. Careful examination revealed no diseased conditions about either the lungs or heart. Careful palpation and percussion of the abdomen yielded negative results. There was no complaint of disturbance of either the gastric, renal, or other functions. The urine was normal in color and quantity, and had a specific gravity of 1014.

About eight months previously—*i. e.*, April, 1895—she began to notice some pain accompanied with blood on micturition. This was shortly followed by a more or less constant pinkish discharge from the genital fissure. The self-examination which followed revealed a tumor at the meatus urethræ. This tumor continued to increase in both size and hemorrhagic tendency until she was prompted to consult Dr. Morris, who curetted the neoplasm thoroughly and treated it with styptics. This brought apparent recovery, which endured but for only a short time, when the mass reappeared with granulations of greater exuberance than previously. The patient, however, declined to accept further operative interference until she was brought to me. At that time I found a black, lobulated, and eroded mass, about three centimetres in diameter, separating the labia majora. The orifice of the urethra was in the very centre of this mass. A careful vaginal examination was not made at the time, as the virginal structures, present in their integrity, rendered such an exploration very painful.

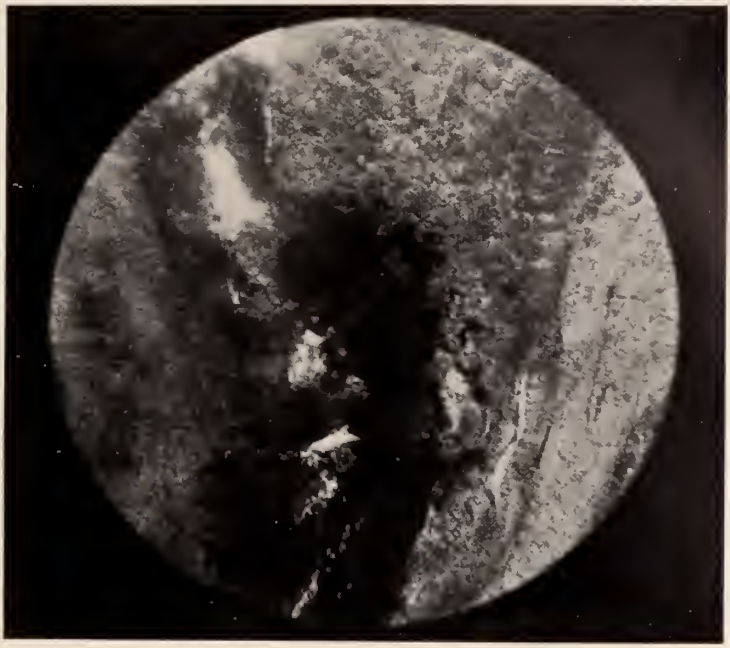
The operation was done the next day, December 4th. The small blade of a Jones speculum—an excellent self-retaining perineal retractor—was introduced. The patient being in the Simon posture, the urethra was by this means exposed in its entire length. A longitudinal incision was made through the mucous membrane, along the dorsum of the urethra, from a point where the presenting part of the mass was eroded, to the base of the bladder. Another incision through the mucous membrane was made at right angles to the foregoing at a point far enough above the eroded mass to insure healthy tissue. The mucous membrane was then dissected back in two lateral flaps and the urethra was enucleated.

The urethra was found to be distinctly conical in shape, the base of the cone being at the meatus, the apex at the bladder. Care was taken to dissect out the canal to a point manifestly above the zone of malignant involvement. When this point was reached, but a slight distance from the bladder, the canal with its neoplastic walls was excised. The cut margin of the cystic segment of the canal was seized at various points in its circumference by Kocher forceps, brought down by gentle traction, and fixed by interrupted sutures of silkworm-gut to the vaginal mucous membrane. A self-retaining catheter was inserted and the patient was put to bed. The sutures were removed on the eighth day; the catheter was

dispensed with on the twelfth day. The patient sat up on the fourteenth day, when she found that she could retain her urine and void it at will. She was dismissed December 21st, entirely healed.

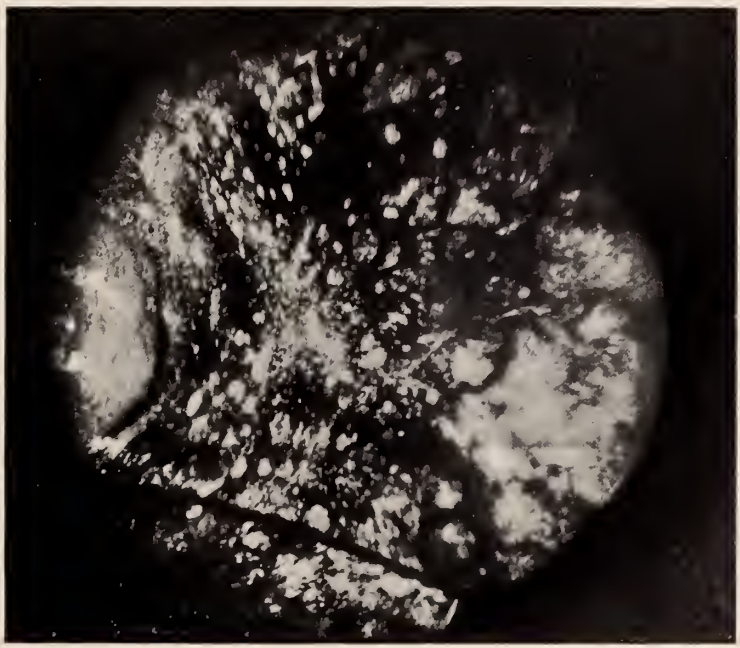
She remained in good health until July 1st following—seven months—when she again summoned Dr. Morris because of some stomach symptoms. He found her suffering from persistent vomiting and with a large mass in the epigastrium. This mass rapidly increased in size until it occupied all of the area between the navel and the breast bone, its nodular characteristics becoming more and more pronounced. She died of exhaustion July 14, 1896, having had no recurrence whatever of the urethral trouble. No autopsy was permitted.

The specimen removed was submitted to Professor S. P. Kramer for examination. It was a dark mass, trilobar and conical in shape, being about two centimetres in diameter at its base and about twenty-five millimetres in diameter at its apex. Its longitudinal diameter was, approximately, three and a half centimetres. It had a distinct investment capsule of loose connective tissue, which was broken off at the margin of the eroded base. The base of the tumor was pierced in its centre by the meatus urethræ, was eroded, black, and presented the appearance of a diffuse ecchymosis. This dark coloring was found, on section of the tumor after hardening, to depend upon diffuse pigmentation, which, however, was more marked in one lobe than in the remaining two (Fig. 1). The cells are of the small round variety, although in some parts they are of a larger size. The stroma is very slight, while in some parts it is practically absent. Some pigmented cells may be found interspersed throughout the growth, while in one lobe the non-pigmented cells are gathered in clusters, each cluster being surrounded by heavy deposits of pigment (Fig. 2), most of which is found in cell bodies, but much of it is apparently enmeshed in the slender fibrillæ of the stroma. A cross-section of both the urethra and of Skene's follicles reveals the epithelium of the mucous membrane of each practically undisturbed. The investment capsule can be distinctly traced and consists of connective tissue, the inner surface of which alone presents slight evidence of round-cell invasion.



Showing extensive areas of pigmentation.

FIG. 2.



Showing deposits of pigment surrounding non-pigmented areas.

TREATMENT OF THE STUMP TO PREVENT ADHESIONS.

By JAMES FAIRCHILD BALDWIN, M.D.,
COLUMBUS.

Since the mortality following abdominal section has been reduced, by the operation of well-known causes, to about 5 per cent. in the hands of skilled operators, attention is more than ever directed to the causes producing this remaining mortality. While large statistics are not available, the estimate is probably not far out of the way that 1 per cent. of all cases operated on die from intestinal adhesions forming at the site of the operation. If, therefore, we can by any means prevent the formation of adhesions, we have at once reduced our present mortality by 20 per cent.

Walthard's discovery that the exposure for only twenty minutes of intestines to dry air would cause sufficient injury to produce adhesions after the return of the intestines to the abdomen, has resulted in the careful protection of intestines by moist sponges or pads, so that we no longer anticipate adhesions as the result of exposure. Sänger, while using dry asepsis, out of one hundred and thirty-two sections lost nine from intestinal obstruction. After adopting moist asepsis, out of seventy-six sections none died from peritoneal adhesions. By moist coverings, therefore, this danger from adhesion of the intestines to each other seems to be practically eliminated.

At present the danger of adhesions seems to lie chiefly in the presence of the raw end of the stump left after removal of tumors, pustubes, etc., or in the presence of raw surfaces left after enucleating growths or masses from the pelvis. As to the covering of raw surfaces, nothing can at present be added to the suggestions offered by Dr. Marcy.

In performing abdominal hysterectomy, either for tumors or for the purpose of removing an infected uterus when removing the

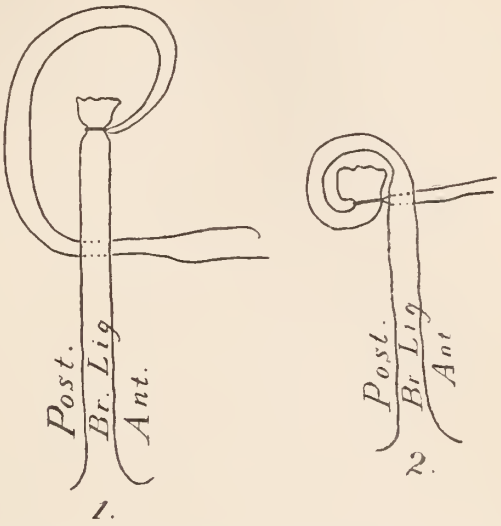
appendages, or a uterus which, from the removal of the appendages or for any other reason, has become denuded of its peritoneum, the cases must be exceedingly rare in which sufficient peritoneum cannot be obtained, either from the front or back, to entirely cover all the raw surface, giving an entirely smooth and intact floor to the pelvis. I think this method of closing in the stumps of the broad ligaments and cervix is now adopted by nearly all operators, and is certainly a distinct advance over the methods described and depicted in even our most recent works on gynecology. To contribute a little to the technique by which raw stumps may be avoided is the object of this brief paper.

In the case of pus-tubes, if removed in the ordinary way, there is left not only the raw stump, but in this stump is the end of the tube with its mucosa, of more or less doubtful asepsis, pouting into the peritoneal cavity. By a little care the tube itself, which does not bleed, can be separated and cut off by a wedge-shaped section in the horn of the uterus, the artery tied separately between the folds of the broad ligament, and the parts so brought together by a running catgut or kangaroo-tendon suture as to leave no exposed surface whatever. This method is, of course, not original with me, but has been used by others.

In the removal of ordinary ovarian tumors which are supplied with a pedicle of greater or less size, one of two procedures should be resorted to to obviate leaving a raw surface. If the pedicle is large it should be clamped as high up as possible for the temporary control of hemorrhage, and the tumor removed; next the peritoneum on the anterior surface of the pedicle, or, if none can be easily obtained here, then on the posterior surface, should be dissected down until a sufficient flap is obtained, and the pedicle then ligated in sections at the base of the flap, but not including it; the portion of pedicle above the ligature is cut off, and the raw surface, including the ligature, covered in by the peritoneal flap, which is caught down with fine catgut.

In case the pedicle is not too large it can be ligated in the usual way, care being taken merely to keep the ends of the ligature on the anterior face of the pedicle. The pedicle is then severed as usual, and the raw end of the stump covered by rolling it against and under the posterior surface of the broad ligament. This is done by passing the ends of the original ligature through the broad

ligament from behind forward, about half an inch apart, and tying them. As the ligature is tightened the raw surface of the stump rolls down until it is completely covered by the broad ligament. (See diagrams.)



Diagrams to show the rolling under of the exposed stump. In Fig. 1 the broad ligament is transfixed by the ligature from behind forward. In Fig. 2 the stump is shown rolled under and the ligature ready to be tied.

Adhesions form at once. I have used this method of covering the stump very many times and with uniform satisfaction.

In all cases where it is possible the omentum should be carefully drawn down and spread out so as to be interposed between the intestines and any exposed or raw surface.

DISCUSSION.

Dr. Edwin Ricketts, of Cincinnati.—Mr. President: The treatment of the stump in operations of this kind has been one of serious consideration by men doing abdominal work for many, many years. We all know that when the stump is left in the ordinary method, sticking up, as it were, with a ligature around it, with the top of the stump in that position, in 3 or 4, if not 5 per cent. of the cases we have an adhesion to the stump as the result. Many times in such adhesions

we have bowel obstruction following, and before we can free the intestine from the stump, as is claimed by some, the patient is dead, if we do not interfere by a surgical operation, which consists of reopening the abdomen. This is a simple procedure of Dr. Baldwin's. I have never had it put before me until the doctor came to this meeting, and I must say that from a theoretical standpoint I am very much pleased with it. We know it is the little things in abdominal surgery that must be acquired and mastered, and when we are able to turn in, as it were, the stump in the manner the doctor has described, and we can do it successfully, it is a great addition to our work. There are some things in connection with this that attract my attention from a critical standpoint. In doing this the great danger is in turning the stump under. Dr. Baldwin did not say anything in regard to that. There is a danger of twisting it under too tightly, and then we must consider that the portion of the stump below the ligature in time becomes aborbed. A case in point:

A lady who came under my care in the early part of my work had to have her abdomen opened for the removal of a pus-tube. She acted badly under the anesthetic. This was the only time in my experience that I refrained from removing the opposite tube. Nineteen months after this she returned to my private hospital very much improved, and insisted on having the opposite tube removed. After the abdomen was opened I concluded to make some investigations in this particular case to see if the ligature was *in situ*, and the stump which was made nineteen months previously was well rounded. The silk could not be found anywhere in the abdominal cavity. I did make an extensive search. This is in line with the theory advanced by Mr. Tait, that in eighteen months, where Chinese silk twist is used, it becomes absorbed. Another point of value is that the surgeon should know that every piece of silk that goes into the abdominal cavity is of the purest kind. Abdominal surgeons are not giving this matter the attention that it should have. They are becoming a little careless in regard to ligatures. As to this operation, with the stump above, this ligature is going to be absorbed, and the fact of turning it under with the possibility of tying it too tight, causing sloughing of the stump above the ligatures, may furnish a point of infection that may give serious trouble. This is a point for serious consideration, theoretical as it may seem. It seems the method of Dr. Baldwin is all that could be desired, and I am very much in favor of treating these stumps in this particular way.

Dr. L. H. Dunning, of Indianapolis.—I do not wish to say very much, but I want to thresh over some old straw in the matter of the

treatment of the stump in cases of oöphorectomy. We make a great mistake if we leave a raw surface in ordinary cases. I would ask the author if he applies this method in salpingo-oöphorectomy, as well as in all other stumps.

Dr. Baldwin.—No.

Dr. Dunning.—I am strongly of the opinion, after four years' use of somebody's method—I do not know whose; I thought it was mine, but may be it is not—of cutting off the tube at the uterine horn and then separating the mesosalpinx, cutting off the ovary, tying the ovarian artery, and with continuous stitch beginning at the outside, whipping it over, turning in every particle of the raw surface, that it is a good procedure. It yields beautiful results, and when employed I have not seen adhesion of intestine to the stump or any serious trouble result. I must say that this method needs to be used with caution, for the reason that occasionally we have a vascular subject in which it would be hardly safe to resort to it. However, I have no difficulty at all in using it, and it enables us to do away with the constriction of a large amount of surface. It also enables us to remove every particle of the tube from the horn of the uterus, and in various other ways I believe it is the most beneficial method to pursue. There is one exception I would like to make to it, and that is in cases of retroversion of the uterus. We all know, those of us who have done a great many operations, that we frequently have cases of retroversion of the uterus where it is necessary to overcome that to do ventral fixation, unless we use the *en masse* ligature upon the stump. If we do this, we overcome the retroversion. In cases of retroversion where a double salpingo-oöphorectomy must be done, I would use the *en masse* method, leaving the stump long enough to cut a wedge-shape piece and turn in the raw surface.

Dr. W. G. Macdonald, of Albany.—I have nothing special to say in regard to the covering in of stumps in the intra-peritoneal treatment for a hysterectomy or the simple removal of the appendages. In my early work I did not make any effort to do very much of that sort. In Albany, four years ago, we had a series of cases in which there was considerable obstruction of the bowels due to the fastening of these raw stumps to portions of intestines, and we lost a couple of cases from that source. After that Dr. Vander Veer commenced sewing the peritoneum over the stumps, and was doing it more than a year before I commenced to do it. It seemed to me in the nature of refinement, and I have not believed in refinements in abdominal surgery. An operation that cures the patient in the shortest time and with the smallest incision is a thing I always desired to do, rather

than to take time to stitch over stumps and add a quantity of silk to the abdominal cavity. I preferred not to do it. More recently, where we have had a considerable sized stump, we have been doing a great deal in covering the peritoneum and closing in the raw surface. There are many cases where there is much pus where it is practically impossible to do this. Dr. Stone gave a demonstration in Atlanta of a beautiful method, something similar to the one described in the paper, for the removal of pus-tubes. In those cases where we have to put in drainage-tubes this method does not apply. In doing a hysterectomy without a clamp you can sew over from one side entirely to the other by an over-cast stitch, and it is a beautiful looking operation when it is completed. But it certainly requires in many cases some little lengthening of the incision, and it takes more time to do the operation.

Dr. Walter B. Chase, of Brooklyn.—I would like to ask Dr. Macdonald the reason for his preference (in covering in the raw surface) of silk to fine catgut. It is certainly expected to unite in a couple of days. What is the advantage of leaving silk, which takes a considerable length of time to absorb and disappear.

Dr. Macdonald.—I am very glad to answer the doctor's question. Simply because I do not believe there is any animal ligature yet invented, kangaroo tendon, catgut, or anything else, in the use of which we can be so certain of asepsis as we can of a piece of silk.

The President.—The history of the treatment of the pedicle is interesting to all of us. The early management of bringing ligatures out of the incision and waiting to withdraw them from the pedicle, and the early history of ovariotomies, give but few cases of intestinal obstruction. Of course, their records were not as carefully made as ours. Recently there has been a great deal said about the pedicle. Take the reports of Marcy. He has made reports of his work from time to time with a *nil* mortality. He goes into the meeting of the American Medical Association, and we question whether he has ever lost a patient. He has demonstrated that such things as painting the pedicle, etc., were errors in technique. He reported some five or seven cases in which there were bowel obstruction with adhesions to the pedicle. Some of them were painted with pure carbolic acid. In supra-vaginal amputations, if you strip the peritoneum down one-half, you can take a stitch and catch the peritoneum over all. You can treat your pedicle in ovariotomies just as a surgeon does any skin flap to cover muscle and bone in amputations. These are simple procedures. With a little healthy pedicle there is less danger of adhesions than when you have a large denuded surface. In suppurative forms of disease you have a nucleus for subsequent infection.

Dr. Albert Goldspohn, of Chicago.—The simple fact that silk is easy to sterilize is not sufficient reason for tying pedicles with it. We can safely sterilize animal ligatures, since we know that we can subject them to the combined effects of heat and chemical antiseptics. It is a good deal more laborious to make such ligatures, and it is not so pleasant to work with them by far as with silk; but the results to the patient are very much better. But I do not mean by this that all peritoneal sewing is properly done with animal ligatures, because this matter of covering stumps with adjacent available peritoneum is very much like sewing the intestines. There we can use only non-cutting, fine needles which have small eyes, and for such use very fine silk is the only proper thing to employ.

Dr. D. Tod Gilliam, of Columbus.—Dr. Baldwin's method is meritorious and easy of execution. There is one phase of the matter that has not been mentioned here, and that is, we do not entirely escape the chances of adhesion when we cover the stump with peritoneum. I have had occasion to reopen the abdomen a number of times after an abdominal section, and I have found in every instance that the intestine or omentum was adherent to the line of incision, notwithstanding the fact that the peritoneum was nicely approximated. The only benefit from covering the pedicle is that you diminish the area, and possibly to a certain extent the strength, of the adhesions. Greig Smith a year or more ago demonstrated that we could get stronger adhesions between muscular or other tissues than between peritoneal surfaces. Hence I say that by bringing the peritoneum together over the stump we not only diminish the extent of the adhesions, but also their firmness. By Dr. Baldwin's method we preclude the possibility of adhesions by removing the plastic end of the stump from contact with the viscera.

Dr. Rufus B. Hall, of Cincinnati.—It is conceded that only a small per cent. of all cases operated on have accidents following the non-covering of the pedicle, as mentioned by the essayist. This does not relieve us, however, from the responsibility of covering the pedicle if any benefit is to be derived from it. I think the majority of operators concede that we will more likely have adhesions when the pedicle is not well covered with peritoneum.

I remember in 1889 reporting a case of intestinal obstruction following the removal of a sarcoma of the ovary at the St. Louis meeting of the Mississippi Valley Medical Association. In this case I had a large broad pedicle when ligated, and in which the peritoneum was not covered over. This case I had to reopen for intestinal obstruction on the fourth day. I relieved the adherent coil of intestine, which was fixed

to the pedicle in such a manner that when the obstruction was liberated the patient's bowels moved while she was on the operating-table. This case made a vivid impression upon me, and since that time, where I have large pedicles to deal with, I have covered the pedicle with peritoneum. In many cases of narrow pedicle I have not paid any attention to it until recently.

On the 9th of September last I operated on a patient for a small ovarian cyst. The pedicle was very narrow. The whole thing was not larger than my index finger. It was tied off *en masse;* but two or three days before I left home I operated on her again for the relief of intestinal obstruction on account of adhesions to the pedicle. I mention this case to emphasize the fact that we cannot always tell whether a large or small pedicle will be productive of adhesions. As a general thing, the larger the raw surface the more likelihood there is of adhesions. For several months I have made efforts not to leave a particle of raw surface in the abdomen or pelvis where it can be covered over by peritoneum.

Dr. Baldwin, closing the discussion, demonstrated his method of covering the stump, and said: A number of operators who have done me the honor to see me operate have commented on the method so favorably that I thought I would bring it to the attention of the Association.

RESECTION OF ARTERIES AND VEINS INJURED IN CONTINUITY. END-TO-END SUTURE. EXPERIMENTAL AND CLINICAL RESEARCH.

By J. B. MURPHY, M.D.,
CHICAGO.

The idea of suturing an artery after it had been injured was conceived by Lembert, and a case is reported by Broca in 1762, in which suture of a longitudinal incision of an artery was successfully made. Assmann, in 1773, treated of it in a dissertation at Groningen. The latter made two experiments on animals; both resulted unfavorably through an obliterating endarteritis. He then abandoned the work. Henry Lee, of London, in 1865, made some experiments with puncture to ascertain how large an opening could be made without fatal hemorrhage, and described the method of repair in arteries without suture; Beale made an extensive microscopic examination of Lee's specimens, giving the pathologic histology of repair.[1] In 1883 Gluck reported nineteen experiments with arterial suture, but in all of these cases his efforts were futile because he was unable to control the hemorrhage from the needle-punctures through which the suture was introduced. He also devised aluminum and ivory clamps for the purpose of uniting longitudinal incisions in the vessels, and succeeded with the ivory clamp in one experiment on the femoral of a large dog.[2] Von Horoch, of Vienna, had thrombosis in six experiments, including one end-to-end union (1887). The most extensive, and, indeed, the only work of true merit performed in this line was by Dr. Alexander Jassinowsky, of Odessa. His first paper was read at Dorpat in 1889; his second was published

[1] Transactions of the Medico-Chirurgical Society, vol. 50, p. 477.
Langenbeck's Archives, 1883.

in Langenbeck's *Archives*, 1891. Bruci, in 1889, sutured six longitudinal incisions in arteries of dogs, and was successful in four. Tansini, of Modena, in 1890, endeavored to close the arteries by absorbable horn clamps. Muscatello successfully sutured a one-third division of the abdominal aorta in a dog. Heidenhain (May 28, 1894) closed by catgut suture an opening in the axillary artery one centimetre long, which was accidentally made while removing adherent carcinomatous glands. The case made a good recovery; circulation in the extremity was not disturbed. In the same year (1894) Robert Abbe made some very interesting and instructive experiments, placing sterilized glass tubes in vessels with the intention of uniting them and re-establishing the circulation.[1] Von Zoege-Manteuffel, in April, 1895, operated on an arterio-venous aneurism in Scarpa's triangle. He wounded the common femoral and made a successful lateral suture of the wall.[2] J. Israel, in discussing Gluck's paper, mentioned that he had closed the common iliac, which had been torn for two-thirds of its circumference in an operation for a perityphlitic abscess, by inserting five fine silk sutures through the entire wall of the vessel.[3] It does not seem possible, from my observations experimentally, that two-thirds of the circumference of a vessel the size of the common iliac could be closed with five sutures and have the seam blood-proof. Heidenhain endeavored to accomplish the closure of arterial wounds in the carotid of dogs by suture, but failed. Sabanyeff, of Odessa, successfully closed a small opening in the femoral artery with suture in 1896. Billroth, Schede, Braun, of Konigsberg, Schmidt, and others successfully sutured wounds in veins, and the closure of wounds in veins by suture is now an accepted surgical procedure. I recently closed an opening three-eighths of an inch long in the common jugular with five continuous silk stitches. Small openings in veins have frequently been closed with lateral ligature. I cannot find recorded a case in which an artery has been sutured after complete division.

For the purpose of determining whether this were practicable, and whether a considerable portion of the artery could be resected, I have performed the following experiments:

[1] New York Medical Journal, January 13, 1894.
[2] Berl. klin. Woch., 1895, No. 34.
[3] Berlin. Cent. f. Chir., Dec. 7, 1895.

Experiment I.—March 4, 1896. Male dog, weight forty pounds. An oblique incision dividing one-third of the circumference of the left common carotid was made and closed with a continuous silk suture penetrating all the coats of the artery; only a small portion of the artery deuuded. There was some hemorrhage from needle-punctures after the clamps were removed, which subsided rapidly under digital pressure; the wound was closed. The dog showed no unpleasant symptoms after the operation. There was a slight swelling on the left side which lasted about a week.

Post-mortem, March 25th, twenty-one days after operation. There was some new-formed connective tissue at the seat of operatiou. The sutures were not infected; the calibre of the vessel was only slightly diminished. The silk was covered and could be seen under a thin layer of exudate from the inner side of the vessel. There was no thrombus. The intima had been fractured by one of the clamps, at which point it was rough and somewhat thickeued.

Experiment II.—March 4, 1896. Dog, weight fifty pounds. Right commou carotid was exposed and opened by a longitudinal incision of one-third of au iuch. The opening was closed by interrupted sutures involving all the coats. There was some hemorrhage after the clamps were removed, which ceased after digital pressure of two minutes' duration. The external wound was closed with silkworm-gut.

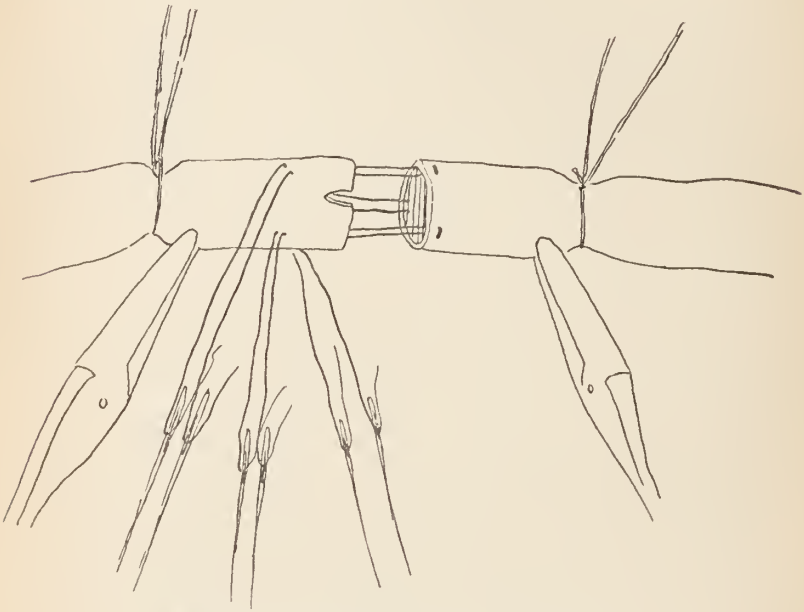
Post-mortem was made March 25th, twenty-one days after operation. There was considerable exudate around the position of sutures, but the sutures were not infected. The wall of the vessel was thickened on the side of the suture. The caliber of the vessel was diminished one-third; the suture was not exposed in the vessel, it was covered with a deposit. There was no thrombus. There was some roughenіug of the iutima at the position where the clamps had been placed.

Experiment III.—March 7, 1896. Huuting-dog, weight about fifty pounds. The left femoral was exposed and an incision oue-half inch long was made in its wall; it was closed with a continuous silk suture; vessel one-eighth inch iu diameter. Vessel was clamped with one-eighth inch Billroth forceps covered with rubber, care beiug taken not to compress the artery sufficiently to injure the iutima. There was no difficulty in producing an accu-

rate approximation of the margins of the wound with silk sutures. A very slight hemorrhage took place through the needle-holes after the clamps were removed, which ceased in less than a minute. The external wound was closed with silkworm-gut.

Examination of left femoral, March 15th, eight days after operation. Union, no hemorrhage, no suppuration; the vessel was completely thrombosed.

Fig. 1.



Method of inserting sutures to produce invagination.

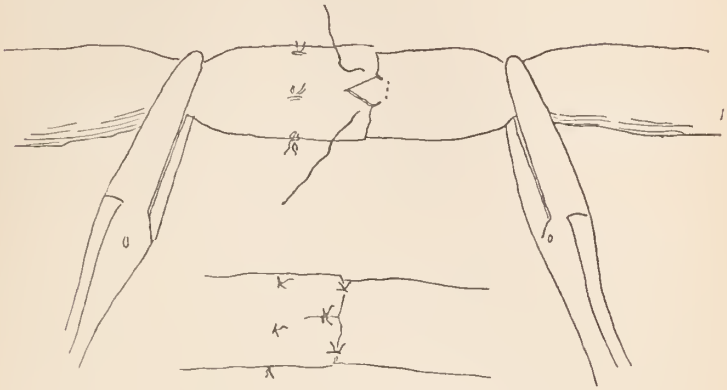
Experiment IV.—Same day, same dog. Invagination of right femoral after complete division. Two double-needled silk sutures were used to draw the intussusceptum one-third inch into the intussuscipiens, as shown in Fig. 1. Several interrupted sutures bind the end of the intussuscipiens to the circumference of the intussusceptum (Fig. 2).

Examination, March 15th, eight days after operation. There had been no hemorrhage from the vessel. A slight infection had taken place around the seat of operation. The artery was thrombosed.

Microscopic examination showed the lumen filled with a red

thrombus and the wall to consist of two distinct muscular layers, both diffusely infiltrated with round cells. The lumen was very small and the wall very thick.

FIG. 2.



Method of inserting external sutures.

EXPERIMENT V.—March 11, 1896. Dog, weight sixty pounds. Large head and neck. Resection of three-fourths of an inch of right common carotid. The proximal end was invaginated with three silk sutures; several sutures penetrating the adventitia and media were used to secure the end of the intussuscipiens to the periphery of the intussusceptum. The sheath was sewed over the vessel. The adventitia was separated from the media on either end. The Billroth clamp-forceps were used to suppress the hemorrhage.

Post-mortem, April 15th, thirty-five days after operation. Some periarteritis and adhesions existed. The sutures in the skin had suppurated. The area around the vessel was not infected; there was but little contraction at the position of approximation.

Microscopic examination: there was some thickening in the wall. The thickening in the media was more pronounced than in the intima; the process was not progressive. There was nothing to indicate that the artery would not have remained patulous. The wall of the artery showed no evidence of injury by the clamps.

EXPERIMENT VI.—March 11, 1896. Left common carotid in same dog as in Experiment V. Resection of one-half inch of artery. End-to-end suture without invagination. The suture

penetrated all the coats; it was continuous, and contracted the artery considerably at the line of approximation. It was made with two needles on one thread and a continuous figure-of-eight stitch. There was a little hemorrhage from the needle-holes after the sutures were placed. This subsided under a sponge pressure of two minutes' duration. The sheath was not sutured around the vessel. Clamps were the same as used in Experiment V.

Post-mortem, April 15th, thirty-five days after operation. The wound was suppurating down to the artery. A pocket of pus existed deep in the neck. All of the arterial sutures were exposed in the bottom of the wound. The artery was thrombosed.

Microscopic examination: the artery presented just the opposite condition from its fellow on the left side, described above. The intima was very much thickened and was rapidly obliterating the tube. The histology was that of organization of clot; connective cells and bloodvessels were taking the place of coagulated blood. The media was likewise somewhat inflamed. There was some inflammation along the lymphatics and adventitia, and there were numerous foci of infection. The case was a typical infective endarteritis with the formation of coagulum.

Experiment VII.—March 15, 1896. Dog, weight forty pounds. Longitudinal incision in the right iliac five-eighths of an inch in length, was closed with a continuous silk suture, including all of the coats of the artery. Five days after the operation a very marked swelling appeared at the position of suture, and blood began to ooze from the line of union. The dog was again anesthetized, the cutaneous sutures were removed, the margins of the wound were separated. A decomposed clot about the size of a hen's egg was carefully elevated. There was an absence of union of the wall of the vessel, and when the clot was removed profuse hemorrhage ensued. A ligature was placed above and below the incision in the artery and that portion of the vessel excised. The cause of the non-union of the vessel in this case, I believe, was infection. There was no clot in the artery.

Experiment VIII.—March 18, 1896. Dog, weight thirty pounds. A longitudinal incision one-half inch long was made in the abdominal aorta, which was closed with a continuous silk suture including all the arterial coats. A slight hemorrhage occurred through needle-punctures after clamps were removed, which ceased

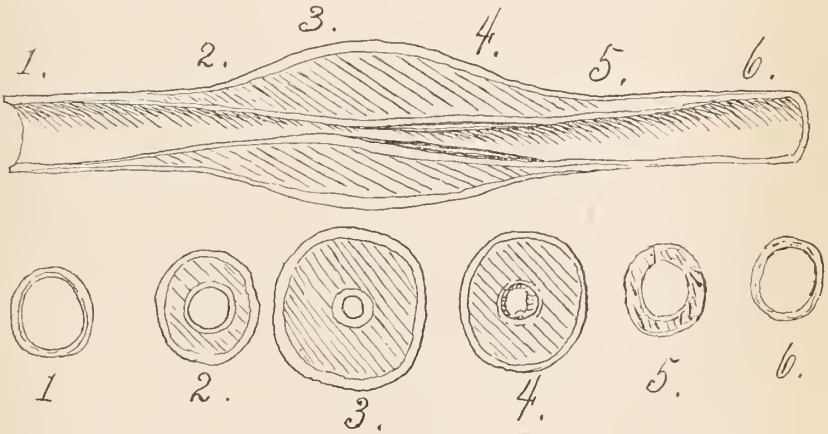
on one and one-half minutes' digital pressure. No effort was made to cover the line of suture with adventitia or peritoneum.

The dog died March 28th. Post-mortem: retro-peritoneal abscess around artery. Complete occlusion of caliber of artery. General suppurative peritonitis was the cause of death.

Experiment IX.—March 26, 1896. Dog, weight sixty pounds. Invagination of left carotid by three double-needled threads attached to the intussusceptum, and interrupted silk suture of the intussuscipiens, involving only the tunica adventitia and media of the proximal side.

Post-mortem, April 25, 1896: left common carotid surrounded by considerable exudate with suppuration around one of the cutaneous stitches. A small sinus led down to one of the sutures at the position of approximation. The vessel wall was considerably thickened at the line of union, as shown in Fig. 3. The vessel admitted a considerable stream of water through it immediately after its removal. It was somewhat dilated on the proximal side. The collateral branches were enlarged.

Fig. 3.



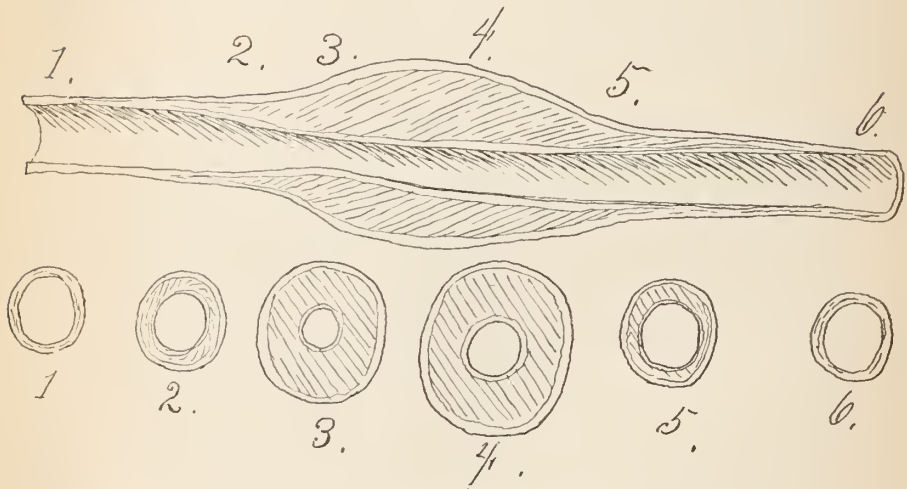
Diminution of lumen of the vessel, with thickening of the wall, from Experiment IX.

Microscopic examination: most evidence of endarteritis at 3 and 4, Fig. 3. Much of the tissue between 2 and 5 seemed accidental. The invaginated walls could be outlined, but the line of demarcation between them was scarcely discernible. The connective tissue around the artery showed a large number of bloodvesels,

and a cross-section of a nerve of considerable size. There was a small amount of inflammation of the vascular and lymph channels at that point. In the adventitia there was a violent acute inflammatory process with foci, which resembled those of suppuration. The showing in the media was the same as in the right carotid. In the intima the process was still more violent. The inner elastic lamina was so broken up as to be unrecognizable.

Experiment X.—Same dog as in Experiment IX.; same day. Resection of one-half inch of right carotid. Adventitia peeled back. Three double-needled sutures were attached to the intussusceptum and put through the intussuscipiens from within outward, invaginating the intussusceptum one-third inch; then sutured the intussuscipiens to the periphery of the intussusceptum, as shown in Fig. 2. The sheath of the artery was sewed around it; the adventitia was not sutured.

Fig. 4.



Thickening of the arterial wall and diminution of the lumen of the vessel, from Experiment X.

Post-mortem on right carotid, April 25th, showed no suppuration around the artery; considerable inflammatory exudate; artery enlarged at position of invagination, as shown in Fig. 4. Nerve and vein involved in exudate. Vessel admitted a stream of water about one-half its normal diameter. It was enlarged on the proximal side of the union.

Microscopic examination showed marked evidence of endarteritis. The line just below 3, Fig. 4, indicates a suture. At 2 much exudate, but less than at 3. At 4 the lumen is about one-half as large as it is at 1 and 5. Lumen at 3 is one-half of what it is at 5. Most of the tissue between 2 and 5 is foreign. There is a moderate amount of inflammation in the adventitia and a large number of new bloodvessels. Muscle-fibres of the media alternate with bands of small round cells. Capillaries in the outer walls are apparent. The region of the intima is the seat of a very marked round-celled infiltration; capillaries can be seen in this coat. The thickness of the intima is markedly increased and the lumen is about one-third of the normal size. There are no endothelia lining the intima. Another section presents the same appearance, except that what remains of the lumen is a triangular opening. There are sections of nerves in the loose tissue surrounding the vessel.

It will be noticed that notwithstanding the invagination had been made thirty days previous to the post-mortem there was no clot in the vessel, and the diameter of the lumen was one-third of that above and below the point of union, showing that the endarteritis had progressed slowly.

Experiment XI.—April 26, 1896. Calf, six weeks old. Excision of one-third inch of left common carotid. Invagination of all coats of proximal into distal end for three-eighths of an inch. The artery was clamped with Billroth forceps. It was found to be elastic and free from tension when replaced. Peripheral sutures were used to secure the invaginated portion as described above. There was little hemorrhage after the operation was completed. The sheath was sewed around the artery. There was a tumor around the area of approximation, with considerable swelling for three weeks after the operation, which disappeared almost entirely before the specimen was removed for examination.

Specimen secured June 1st, thirty-four days after operation. One and one-half inches of carotid at point of suture were removed and ends ligated. There was considerable inflammatory deposit over the entire field of operation. The union of skin was complete. The collateral vessels around the position of approximation were considerably enlarged. The vessel was not patulous, the lumen being filled by a clot for a considerable space on the

distal side of approximation; it extended but one-fourth of an inch on the proximal side.

Microscopical examination showed on the outside a loose layer of connective tissue, the fibres of which did not run in any particular direction. Internal to this was a layer of felted connective tissue interlacing and a very rich supply of blood-vessels, richer than is normal in the adventitia. Most of these fibres were of the yellow, elastic variety and interlaced in the general trend of the artery. Internal to the adventitia was the tunica media, consisting of muscular fibres, elastic tissue, and a great abundance of inflammatory cells. Internal to this was the inner elastic lamina. Within this there was a zone, which at some of the points of its circumference was composed of mature connective-tissue fibres; at others it consisted of a pool of blood. Internal to this was a dense mass of muscle-fibres. The fibres of the media were swollen and granular and not in a good state of nutrition. Internal to this was the inner elastic lamina of the invaginated portion of the artery, and the lumen of the tube was filled with a clot. There was some evidence of connective tissue growth in this clot. The union between the artery ends was incomplete.

Experiment XII.—Right common carotid of calf, same as used in Experiment XI., operated May 3, 1896. Resection of one-half inch of artery united with three invaginating sutures. Three peripheral sutures were made as above; but very little bleeding followed the operation. Sheath was drawn over artery. Clamps used as temporary hæmostatics. The skin was approximated with catgut. There was no swelling nor tumefaction after operation, as on opposite side.

June 1, 1896, one inch of artery at point of union was removed and artery was again sutured (see Experiment XIII.). But little inflammatory deposit was found around the seat of the wound. Primary union of skin and subcutaneous tissue had taken place. Some reactive inflammation had taken place around the artery. Water passed freely through the artery when removed.

Microscopic examination: the section showed a mass of granulation tissue older at the periphery than at the centre. The inflammation was somewhat nodular; there were some places where it was more intense than at others. In the centre there was a

small opening, in the walls of which there were young embryonal cells; the artery was being obliterated by a general arteritis.

Experiment XIII.—June 1, 1896. The second experiment on right common carotid of calf. In first experiment of May 3d one-half inch of artery was removed. On June 1st the specimen was removed, one inch being taken out at seat of union. The artery was then sutured end-to-end with interrupted silk sutures, without invagination. There was some tension on the sutures, and the artery was somewhat diminished in size. The left carotid had previously been removed and the ends ligated. When the clamps were taken off there was no hemorrhage at the line of suture. The calf rallied after the operation and was perfectly well.

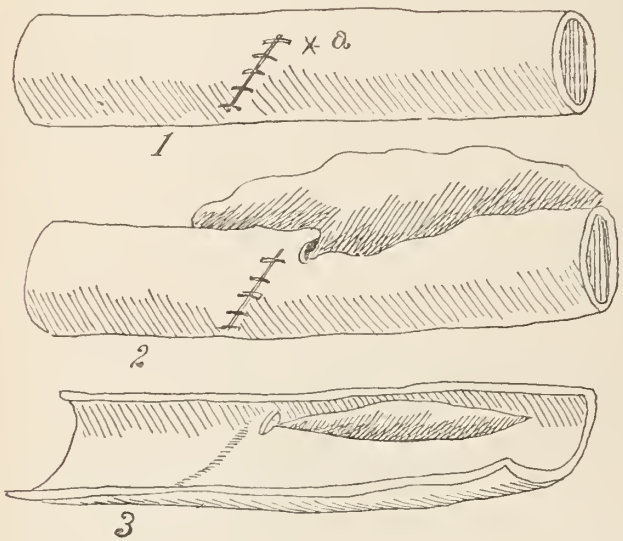
Post-mortem, June 5th, four days after operation. Primary adhesion of wound; the artery was carefully dissected out; there had been no hemorrhage around the line of union. The vessel was patulous; its lumen was slightly diminished. A small, white exudate covered the line of union. The sutures were not exposed in the lumen of the artery, being covered by the exudate. The intima had not been fractured at the point where the clamps were placed.

Experiment XIV.—August 26, 1896. Brown dog, weight forty pounds. Median abdominal incision. The abdominal aorta was located just above its iliac bifurcation and exposed for two inches. Billroth clamps were placed in position. A transverse incision was made in the artery for two-fifths of its circumference. It was sutured with kangaroo tendon, involving all the coats. There was some hemorrhage after removal of the clamps. An additional superficial suture was inserted. The retro-abdominal peritoneum was closed over the artery. The abdominal wound was closed with silkworm-gut sutures. The dog died three days after operation.

Post-mortem: abdominal cavity was filled with blood; no peritonitis. An opening was found in the posterior abdominal peritoneum leading to the vessel. The vessel was removed. A clot of considerable size existed in the retro-peritoneal space around the opening of the vessel; this was continuous with a small clot within the vessel, shown in gelatine specimen No. 2, Fig. 5. The clot on the inner side of the vessel measured three-eighths of an inch in length and one-eighth of an inch in diameter. It was

not adherent to the wall of the vessel, but was continuous with the clot from the outside. There was some discoloration of the intima from the upper clamp and a roughening of the surface at that point, but no clot was formed. The lumen of the artery above and below the suture was free. The kangaroo tendon was softened and would not support its own weight, which accounted for the hemorrhage. On the inner surface of the artery were seen the openings of the small arteries, which were free. There was a

FIG. 5.

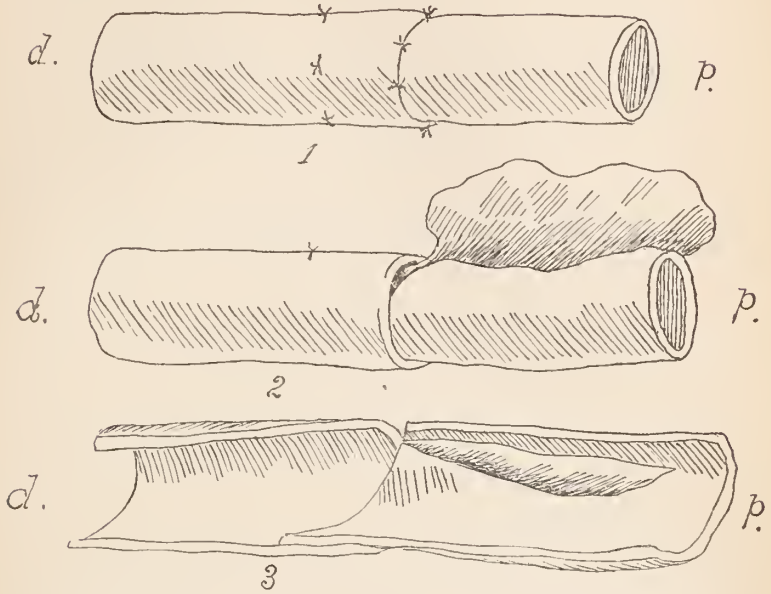


Line of suture and the formation of internal and external coagulum in Experiment XIV.

ragged, transverse opening which was gaping widely at the center. The point of adhesion of the clot was without the arterial wall. The remnants of the sutures were seen penetrating the intima. One and one-half centimetres above there was a point of ecchymosis. One centimetre above that a second point of ecchymosis could be seen, the result of the clamps. The ecchymotic patches were transverse in their long diameter and three-fifths centimetres wide. In the one next to the incision there had been rupture of the deep arterial coats, but the intima had been preserved except at one small point; in the other fracture of the intima and media

had taken place. There was no clot at either of these places. (See Fig. 6.)

Fig. 6.



Perforation of artery and line of union after removal of clot in Experiment XIV.

Experiment XV.—Black dog, weight forty pounds. Operated August 26, 1896. Median abdominal incision. Exposure of abdominal aorta two inches above its iliac bifurcation. A longitudinal incision was made in the artery one centimetre in length. Sutured with kangaroo tendon taken from same bottle as for Experiment XIV. Arterial clamps were placed on artery, as above. Slight hemorrhage from the wound after the clamps were removed. This was controlled by digital pressure for one minute. Posterior peritoneum was not sutured over artery. A great deal of difficulty was experienced in retaining the artery in an elevated position sufficient to admit of suture, as the dog was fat and his abdomen deep. The dog died forty-eight hours after operation.

Post-mortem: Abdomen full of blood. Loose, large clot existed in retro-peritoneal space. The artery was removed for several inches above and below the clot; its lumen was free. There was

no clot on the inner side. The kangaroo tendon was completely disintegrated. Cause of death, hemorrhage.

The general appearance of the artery was normal. Small arteries were seen emerging at different points. The line of incision could be readily recognized. Its edges were roughened and projected about one millimetre into the lumen of the vessel. The ragged incision extended throughout the wall of the artery; in it were seen the remains of the tendon suture. There was no evidence of regeneration, that is, no reaction process in the walls of the vessel. There was some fibrinous deposit on the roughened edges; no tendency to coagulation on the inner side of the artery. About one centimeter below the line of incision was a small ecchymosis where the intima was roughened and endothelia absent; there was also a loss of substance showing a fracture of the intima. There was a small fibrinous deposit on this area.

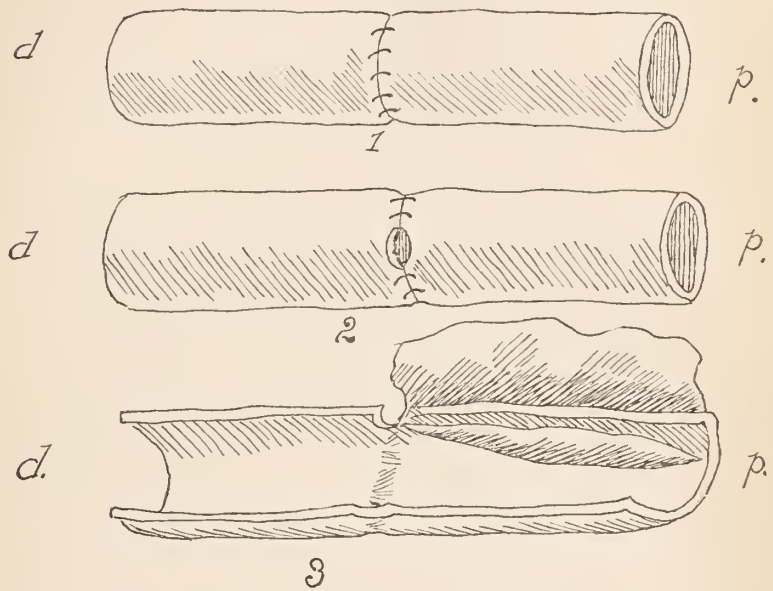
Experiment XVI.—September 6, 1896. Black male dog, weight seventy pounds. Transverse incision dividing one-half of the anterior wall of the abdominal aorta; the opening was closed by a continuous suture of silk with round needle, involving all the coats of the artery. After the clamps were removed there was bleeding from the angle of the wound; an additional suture was applied without the aid of the clamps. After this was done the bleeding ceased and the abdominal wound was closed. Dog died fifty-four hours after operation.

Post-mortem revealed the abdomen full of blood. An examination of the artery showed three-fourths of the line of suture approximated and surrounded by a clot. The last suture which was inserted in the angle of the wound was shown to have included on one side only the tunica adventitia; it did not grasp the media nor the intima. This suture gave way, and from this point hemorrhage took place. There was no regenerative reaction in the intima around the punctures made by the needle. There was no clot formed on the silk that was exposed in the lumen of the vessel. From the ragged edge at the position of penetration a small clot was adherent and suspended within the artery, but not adherent to the intima; it was continuous with the external clot. This clot was about a centimeter in length and a millimeter in thickness; smooth on its outer edge. The endothelium

in the immediate neighborhood was milky white and somewhat roughened.

Experiment XVII.—September 6, 1896. Black and white female dog, weight forty-five pounds. A complete transverse section of abdominal aorta. Continuous silk suture with three needles; edge-to-edge union of artery (Fig. 7). The stitches

Fig. 7.



Position of suture in edge-to-edge union of end of artery and defect in line of suture in Experiment VI.

were closely applied. After the clamps were removed free hemorrhage took place, particularly at one point where the beginning and end of the sutures met. The clamps were reapplied and one stitch was placed at this point. It would have been better if I had made the final stitch overlap the primary stitch, as the artery was contracted when the arterial pressure was off; while the first and last stitches appeared to be close together then; when the artery dilated they were quite a distance apart. Abdominal wall was closed with silkworm-gut.

The dog died September 12th. Post-mortem showed silkworm-gut to have cut through; absence of organic union over entire

length of abdominal incision. An external fistula communicated with the peritoneal cavity. Peritoneal cavity contained a large quantity of pus and some blood. There were many adhesions and a clot of considerable size around the iliac vessels. A clot also existed on the right side of the incision behind the iliac vessels. On the inner side of the artery the clot was adherent and sealed over the line of union. The clot was not adherent to the intima, but adherent to the line of union. A slight, thin white clot had formed over the point where the temporary hæmostatic forceps were placed during the operation. There were no manifestations of inflammatory reaction nor regeneration in the intima; a small, thin clot extended from the point of injury by hæmostatic forceps above down to the line of union. A small, flat coagulum extended from the line of union down to the injury of the intima made by the lower hæmostatic forceps. On the outside of the point where the hemorrhage took place the sutures were exposed. An opening, one-sixteenth of an inch, existed on the anterior surface of the vessel at the line of union, communicating with its caliber, and was partially occluded by a clot. This was the opening through which the fatal hemorrhage occurred. There was an excellent union over the line of approximation. There was no clot in either of the iliac vessels. The intima was somewhat roughened over the entire distance between the position of application of both the forceps. One of the stitches from the point where the hemorrhage had occurred had cut through. There was a small peri-vascular clot around the position of approximation, and blood had burrowed between the tunica intima and media.

Experiment XVIII.—September 6, 1896. Black dog, weight sixty-five pounds. Complete transverse section of abdominal aorta. Invagination of proximal into distal end with three internal sutures; eight external interrupted sutures were inserted, including all of the coats of the artery in each. When the clamps were removed profuse hemorrhage took place from one point. Clamps were replaced and an additional suture inserted; the clamps were again removed, with no escape of blood. Abdominal wound closed with interrupted catgut sutures. On the sixth day after the operation there was some bleeding through the abdominal wound.

Dog died on the eighth day. Post-mortem: general suppurative peritonitis; a complete thrombosis of artery had taken place at the site of suture. There was some blood in peritoneal cavity;

suppuration around the seat of arterial approximation. Two of the sutures had cut through. A thrombus occupied the vessel for two centimeters above the seat of injury and two and one-half centimeters below, that is, between the points where the arterial clamps had been placed. The clot was adherent at these points and free in the vessel over the intermediate area.

Microscopic examination: a clot had formed, completely filling the lumen of the vessel. The surface of the clot was filled with round cells and developing connective tissue. The connective tissue developed from the intima in such a manner as to map the clot off into plaques of round cells mingled with leucocytes and connective-tissue cells surrounded by borders of connective tissue. The intima was markedly thickened, the fibres being separated by bands of young connective-tissue cells. The spaces between the fibres filled with cells were broader than the fibres themselves. The same was the case in a less degree in the media and adventitia. Union had not progressed very far; it was not firm, and tore apart upon slight manipulation. The granulation tissue by which it was held together was in the round-cell stage.

Experiment XIX.—October 27, 1896. Merino sheep, weight ninety pounds. Transverse incision of left common carotid artery. Compression of artery made with strands of gauze. Proximal invaginated into distal end in the usual manner. Four needles

Fig. 8

Contraction of artery at line of suture with clots on proximal and distal sides, from Experiment XIX.

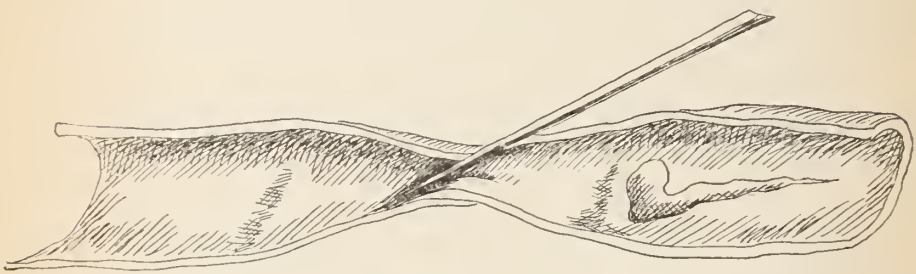
threaded with silk were used. After compression there was some hemorrhage; as one of the sutures had cut through the wall of the artery, another suture was inserted in its place. The artery was very small for invagination.

Sheep died twenty-eight hours after operation from cerebral anemia (see Experiment XX.). Post-mortem: in left common

carotid artery line of suture was scarcely discernible, covered with a cleavage. There was a very small clot on proximal side of suture (Fig. 8). There was injury to the intima by the peripheral sutures. Clot on distal side was not adherent except at position of approximation. Clot on proximal side extended beyond the position of division of the artery one-third of an inch from the point of approximation. The walls of both arteries were firmly adherent. The canal was almost completely occluded by the invaginated portion. Line of union was a little difficult to locate with the naked eye. The caliber of the vessel was so small that the clot at the point of union was about one-sixty-fourth of an inch in diameter.

Experiment XX.—Same sheep as in Experiment XIX. Right common carotid artery. Transverse incision; end-to-end invagination. Artery invaginated with four needles threaded with silk. Adventitia was carefully peeled off. At one point hemorrhage took place, but was checked by an additional suture. Sutures were dipped in beeswax before insertion.

Fig. 9.



Marked diminution in the size of the lumen of the vessel at the point of approximation, from Experiment XX.

Post-mortem: the artery on the right side was thrombosed for three-eighths of an inch on the proximal side and three inches on the distal side of the line of suture. The clot was not adherent to the wall of the vessel above or below the line of approximation, showing that it originated at the line of union. There was no hemorrhage between the adventitia and the media where the former overlapped the line of union, showing it was completely sealed. The artery was very much diminished in size where the four invaginated sutures were tied. There was a discoloration and apparently a

rupture of the intima at the position where the temporary hemostatic ligature was placed. A small clot existed on the proximal side of the suture; both layers of both walls were firmly adherent, requiring considerable force to separate them. The agglutination of the walls was very firm. The caliber of the artery was diminished to the size of a knitting-needle at the position of invagination (Fig. 9). The clot formed from the end of the intussusceptum. One of the stitches crossed on the inside of the artery to which the clot was firmly adherent. There was a slight roughening of the intima where the temporary ligature had been attached, and a small clot one-half of an inch in length formed at that position.

Experiment XXI.—October 29, 1896. Sheep, weight about eighty pounds. Excision of one-third of an inch of left common carotid. End-to-end continuous suture of wall of artery which was not invaginated; sutures waxed while wet. Considerable hemorrhage; three additional stitches were inserted. Hemorrhage was controlled by forceps while operating. Adventitia was sutured over line of union; sheath was replaced and sutured. Irregular active rhythmic contraction of coats of wall of artery noted after removing adventitia.

Post-mortem, November 3, 1896: left common carotid. Clot on distal side occluding artery. Artery was contracted and bent at a right angle. There had been hemorrhage around the line of union; no suppuration. Line of union was difficult to make out. Specimen retained without opening the lumen of vessel.

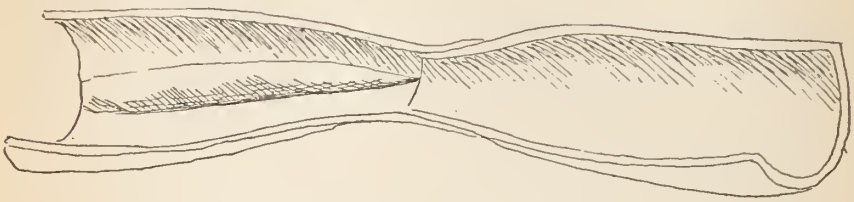
Experiment XXII.—Same sheep, on same day as in Experiment XXI. Oblique incision in right common carotid artery one-third of an inch long was made; continuous silk suture including all coats.

When the adventitia was removed there was a rhythmical contraction of the artery, the same as in an intestine when injured. Artery diminished one-third in diameter. (See Fig. 10.) No hemorrhage followed the removal of forceps.

Post-mortem, November 3, 1896: right common carotid. Clot extended one inch to the proximal side and one-half inch to the distal side of the line of suture. This was very small; it had formed over the position of suture, but was not adherent to the wall of the vessel. It did not completely fill the vessel, and

extended upward from the line of union to the line of fracture in the intima, where it was again adherent. Over one-half of the line of union the silk was covered so that it could not be seen. The artery had been fractured by the clamp.

FIG. 10.



Usual contraction at the seat of approximation.

EXPERIMENT XXIII.—Sheep, operated October 31, 1896. Resection of one-half inch of left common carotid; artery invaginated with four double-needled sutures. The adventitia of the proximal side was torn back; then the proximal was drawn into the distal, bringing the media of the proximal in contact with the intima of the distal. The edge of the intussuscipiens was then approximated with two sutures to the periphery of the intussusceptum. The adventitia of the intussusceptum was then drawn over the line of union and sutured to the periphery of the intussuscipiens, making the order of the coats overlapping each other from within outward, two internal coats of proximal, three coats of distal, adventitia of proximal.

The sheep used for this and the following experiment died November 14th. Post-mortem of left common carotid. Thrombosis at the position of union and a fracture of artery on the proximal side where the hemostatic forceps had been placed, but no clot was adherent to it. On the distal side there was also a fracture of the artery with a clot adherent. A thrombus which did not completely fill the artery existed from this point to the line of suture. The two coats were firmly adherent and could not be separated without laceration. There was a firm connective-tissue deposit outside, completely covering the line of union so that it could not be recognized. There was no hemorrhage around the seat of union. The greatly diminished size of the artery at the position of invagination was, I believe, the cause of the formation of the

clot. Only one suture was exposed outside the exudate, and that was the one used to draw the adventitia over the line of approximation. Specimen given to pathologist for sections.

Experiment XXIV.—October 31, 1896. Same sheep as in Experiment XXIII. Right common carotid artery. A V-shaped incision of one-fourth of an inch on each side was made. It was closed with a continuous suture of six stitches, involving all coats of the artery. The sheep was very sick for two days before death, showing all symptoms of sepsis.

Post-mortem, November 14th, fourteen days after operation. All of the tissues of the neck were infected. There was an absence of union in a portion of the skin, and a most offensive discharge of pus and blood. The tissues of the neck were so much inflamed that their recognition was difficult. A clot the size of a walnut existed on the anterior side of the artery at the line of suture. A thrombus filled the proximal side for half an inch from the opening in the vessel. The opening had increased to three-fourths of an inch in length on the anterior surface of the vessel, showing that there had been an elongation of the opening by a necrosis of the wall of the vessel at the line of suture. The clot had a very offensive odor; pus surrounded the wall of the artery. The distal end of the artery was closed by a thrombus up to the head. This specimen shows the destructive effect of infection in arterial suture better than any of the former ones. Cause of death, sepsis.

Experiment XXV.—November 2, 1896. Sheep, weight, about seventy pounds. Resection of one-fourth inch of right carotid artery; invaginated; continuous external suture. Artery was very small; adventitia not removed; silk had been boiled in a saturated solution of oxalate of ammonium and waxed. Sheath closed over artery with a few catgut sutures.

Post-mortem, November 30, 1896. There was no clot on proximal side of suture nor infection at point of suture. A white, organized thrombus existed, filling the vessel. The exact line of union could not be seen when the thrombus was removed. Thrombus extended for one-half inch on the distal side of the line of suture. Specimen was given to Dr. Evans for examination. Union of ends of artery from a macroscopic standpoint was perfect.

Experiment XXVI.—November 2, 1896. Same sheep as in Experiment XXV. Transverse incision of one-half the circumference of the right jugular vein. Opening closed with a continuous silk suture, which was oxalated and waxed. The wall of the vein was very thin and required considerable care to prevent its laceration with the suture. It was diminished considerably in size by the suture.

Post-mortem, November 30, 1896. Periphlebitis existed at the site of suture. There was no thrombus in the vein. The diameter of the vein at the point of suture was about one-third of its diameter above and below. A white exudate covered the line of suture.

Experiment XXVII.—November 2, 1896. Same sheep as in Experiment XXV. Complete division of left jugular vein; edge-to-edge union with continuous oxalated waxed silk suture. Wall of vein was very thin. The continuous suture contracted the vessel to about one-half its normal size. There was but little bleeding after the digital pressure which had been used for hemostasis was removed.

Post-mortem, November 30, 1896. Periphlebitis of slight degree existed; no edema nor evidence of infection. When the vein was opened it was found that there was a complete occlusion by adhesion at the line of suture. *There was not the slightest thrombus on either the distal or proximal side of the suture.* The thickening from the exudate at the line of suture was scarcely perceptible. The vessel appeared to have retained its normal diameter on the proximal and distal sides of the suture.

Experiment XXVIII.—November 3, 1896. Sheep. Resection of one-third of an inch of left common carotid. End-to-end approximation of artery with continuous oxalated waxed silk suture. There was considerable hemorrhage from artery when clamps were removed, which ceased with slight pressure. Adventitia was not removed.

Post-mortem, November 30, 1896. The diameter of the artery above and below the point of approximation was one-eighth of an inch. The artery was thrombosed for one inch on distal side and three-fourths of an inch on proximal side of suture. The sutures were infected; the lumen of the artery was entirely obliterated.

Experiment XXIX.—November 3, 1896. Same sheep as

in Experiment XXVIII. A semilunar piece half an inch long involving one-half the circumference of the left jugular vein was excised. The opening was closed with a continuous oxalated waxed silk suture; but very little bleeding after pressure hæmostatics were removed.

Post-mortem, November 30, 1896. A thickened inflammatory cord existed at site of suture. There was some edema of the surrounding tissue; about one-fourth of the lumen of the vein was patulous. A white exudate covered the sutures within the lumen of the vessel. There was no thrombus.

Experiment XXX.—November 8, 1896. Black dog, weight about forty pounds. A transverse division through all coats of one-third of the circumference of the abdominal aorta, one inch above its bifurcation, was made. A continuous silk suture of seven stitches was inserted, including all of the coats of the artery. Silk had been boiled in a saturated solution of oxalate of ammonium. The adventitia was peeled off the artery. The suturing was done with a full curved sharp needle with cutting edges. The needle was inserted so closely that three of the openings cut into one; some bleeding took place from this point when the clamps were removed. Two additional stitches were required. The abdomen was closed with two rows of continuous catgut sutures.

Dog killed December 5, 1896, twenty-seven days after operation. The abdominal wound was entirely closed. The dog had increased much in weight; there was no peritonitis; a slight elevation of connective tissue on the anterior surface of the artery at the site of the suture was noticed; the artery was divided; it was very slightly contracted in size at the line of suture. The silk was covered over by a thin, white fibrinous exudate. There was a slight depression of the surface at the site of union. The arterial wall was perfectly healthy above and below, showing none of the effects of the compression clamps. From a macroscopic point of view the greatest support given the artery was from the connective tissue on the outer wall. Specimen was given to pathologist for examination. This specimen illustrates beautifully the process of repair when the field is kept aseptic.

Experiment XXXI.—November 8, 1896. Black hunting-dog, weight about thirty-five pounds. Left common carotid; a longitudinal incision two centimeters long was made. It was

closed with a waxed silk suture which had been boiled in a saturated solution of oxalate of ammonium, and included all the coats of the artery. The technique of the operation was the same as in the other experiments. Seven stitches were inserted in the artery. There was no hemorrhage after hemostatics were removed.

Post-mortem, November 24th. A small clot was found one-third the size of the caliber of the artery, not adherent to it except at point of infection. A pocket of pus one-fourth of an inch in diameter existed around the point of suture, showing that the stitches had been infected. On the proximal side of the suture the clot filled the vessel for one-fourth of an inch, and was adherent. A small free clot existed for three-fourths of an inch on the distal side.

Experiment XXXII.—November 8, 1896. Same dog as in Experiment XXXI. Both carotids were exposed by an incision deep in the neck. A longitudinal incision one and one-half centimetres long was made in the right common carotid. It was closed with a continuous waxed oxalated silk suture, including all the coats of the artery. There was no hemorrhage when the hemostatics were removed. The incision was closed with a continuous suture of catgut.

Post-mortem, November 24th. Dog died evening of November 23d. A sinus leading from the external opening was traced down to the opening in the vessel. The clot around the vessel had suppurated and the sutures had cut through the vessel. There was no thrombus within the lumen. A small white clot was adherent close to the margin of the wound. There was no effort at definitive union. Cause of death, hemorrhage.

Experiment XXXIII.—November 10, 1896. Calf, eight months old. A resection of one-third of an inch of right common carotid was made. Invagination by three internal sutures and seven external sutures. The artery was the size of the common femoral in man; no blood escaped; sheath around artery was sutured with catgut; no drain. The invaginating sutures in this case were inserted differently from those in any of the preceding experiments. They included only the adventitia and media of the invaginated portion, and when tied were not exposed in the lumen of the artery in any place. (Fig. 11.) By this method the size of the artery was not diminished in the same

degree as it had been in any previous experiment. It can be seen that by this method there was no foreign body left in the lumen of the artery, as had been done in the previous method of invagination, and, therefore, there was less likelihood of thrombosis. The peripheral sutures included only the media and adventitia. Temporary hemostasis was produced by a fine strand of gauze tied firmly around the artery. Specimen removed December 5th. Primary union of the external wound had taken place. An extensive induration two and one-half inches in length by one and one-half inches in diameter was found at the site of approximation. This mass was carefully dissected out and the artery was found patulous at each end, although considerably diminished in size. On opening the mass it was found to be a pus-pocket about three-fourths of an inch in diameter. In the centre were found the necrotic ends of the artery and the sutures. The infection had occurred at the suture. The vessel was thrombosed for one-third of an inch on either side of the abscess. The ends of the artery in which the sutures were inserted were well preserved, though the vessel had been amputated by the inflammatory action on either side of the abscess. The thrombi were very firmly adherent to the intima.

Experiment XXXIV.—November 14, 1896. Large black calf, about eight months old. A transverse division of right common carotid was made; end-to-end union by invagination; kangaroo tendon furnished by Dr. Longyear, of Detroit, was used. Three invaginating and six external sutures were inserted, as in Experiment XXXII. No escape of blood after removal of clamps. Adventitia was peeled off and returned over the line of suture. Fascia and sheath were sutured over the artery. A strand of gauze was tied around the artery to produce temporary hemostasis. The vessel was a little larger than the common femoral in man. Pulsation was normal on the distal side of the approximation immediately after operation.

Specimen removed December 5th. There was no induration nor inflammatory action around the site of approximation. Some connective-tissue formation outside of the adventitia was found. There was but one suture exposed within the lumen of the vessel, and that for only a very small extent. When the vessel was opened a thrombus existed on the proximal side of the line of union for

one-half an inch, completely occluding the vessel. This was firmly adherent for the first half of that space; over the line of union and for one-fourth inch on the distal side the thrombus was not adherent; again it was adherent for one-fourth inch, occluding the vessel. It should be noted that the points of adhesion and formation of the thrombus were where the temporary ligatures were placed during the operation, showing that the injury done the artery by the ligature was the cause of the thrombus. The union between the two walls of the artery was firm. The kangaroo tendon appeared to be as hard and firm as when it was inserted.

For convenience in treating the subject of arterial and venous suture, we will consider: (1) The pathologic histology of repair of bloodvessels. (2) The class of arteries and veins amenable to suture. (3) The degree of destruction that may exist and still leave the vessels within the range of repair by suture. (4) The technique of vessel suture. (5) The prognosis of arterial and venous suture.

Pathologic Histology of Repair of Arteries and Veins.

That the clinical aspect of the subject may be better appreciated, let us first consider the histology and physiology of the vessels and blood.

Structure and Properties of Arteries and Veins.

The arteries and veins of the body are the channels through which the blood is carried to and from the tissues and organs. The thin walled capillaries bring the blood into intimate relation with the cells by transudation and migration.

The arteries are distinguished from the veins by their thicker walls, due to the greater development of smooth muscular and elastic tissue. The middle coat of the artery is especially thick, while the outer coat is relatively thin.

The arteries consist of three coats, and are derivatives of the mesoblast. The tunica intima or inner coat consists of a layer of irregular or oblong, fusiform, nucleated squamous cells, forming the excessively thin, transparent endothelial coat immediately in contact with the blood stream. These cells have oval nuclei, and the long axis of the nucleus and cell is parallel with the long axis of the artery. The endothelial cells have no distinct blood-sup-

ply; still they have the power of reproduction, and are possessed of marked potential reactive properties when disturbed mechanically or chemically. This was appreciated first by Jones, who showed in his experiments that on account of its regenerative properties it was necessary to injure the intima to produce successful ligation of the arteries. These endothelial cells are held together by a cement substance. Outside of these lies a very thin, more or less fibrous layer, sub-epithelial, in which numerous spindle- or branch-shaped protoplasmic cells lie imbedded, with a corresponding system of plasma canals. Outside of this is an elastic lamina. In arteries of medium size it is a fenestrated membrane, while in the largest arteries there may be several elastic laminæ or fenestrated membranes mixed with connective tissue. In middle-sized arteries and in larger arteries a few non-striped muscular fibres are disposed longitudinally between the elastic plates or laminæ along with the circular muscular fibres of the middle coat. They may act so as to narrow the artery, but they may also aid in keeping the lumen of the vessel open and of uniform caliber. It is not probable that when they act by themselves they dilate the vessels. The nourishment of the intima is entirely independent of the media and adventitia. Its nutriment is received directly from the blood within the artery.

The tunica media, middle coat or muscularis, contains much non-striped muscle, which in the smaller arteries consists of transversely disposed non-striped muscular fibres lying between the endothelium and the adventitia, while a finely granular tissue with a few elastic fibres form the bond of union between them. As we proceed from the very small to the larger arteries the number of muscular fibres becomes so great as to form a well-marked, fibrous ring of non-striped muscle in which there is comparatively little connective tissue. In the large arteries the amount of connective tissue is considerably increased, and between the layers of connective tissue numerous thick fibres or fenestrated laminæ are concentrically arranged. From a clinical standpoint it can be seen that this coat is composed of histological elements which have very little if any power of regeneration. Repair of injury to these elements is accomplished by the formation of new connective tissue. Ballance and Edmunds claim that the vaso vasorum penetrates this coat. It is certain from the

experiments of Bruci (Pisa, 1893) that the media receives its nutriment from the adventitia either by vessels or nutrient canals, as he demonstrated that a necrosis of the media took place when the adventitia was removed and prevented from readhering by wrapping gutta-percha around the vessel; but the intima was not effected by this procedure except to show evidence of increased proliferation. When the adventitia is torn off and immediately replaced the alteration of the muscularis is scarcely discernible.

The tunica adventitia or outer coat in the smallest arteries consists of a structureless membrane with a few connective-tissue corpuscles attached to it. In the somewhat larger arteries there is a layer of fine, fibrous elastic tissue mixed with bundles of fibrillated connective tissue. In the arteries of medium size and in the largest arteries the chief mass consists of bundles of fibrillar connective tissue containing connective-tissue corpuscles. The bundles cross each other in various directions, and fat-cells often lie between them, next the media; this accounts for the loose adhesion of the two coats and also for the ease with which the adventitia may be peeled off from the media. There are numerous fenestrated and fibrous elastic laminæ. In the medium-sized and small arteries the elastic tissue next the media takes the form of an independent elastic membrane. It contains bloodvessels, to the wall, the vasa vasorum, which are supplied from the nearest branch and not from the main trunk of the artery. These vessels usually extend to the media, never to the endothelial cells. It also contains nerves, the small axis-cylinders extending through all the coats to the endothelial cells and intercellular substance.

The veins have the same anatomical construction, except that the wall is thinner on account of the smaller amount of non-striped muscle and elastic tissue. There is no noticeable primary contraction of the veins when injured as there is in the arteries. They are more extensile under the same strain. The adventitia is usually the thickest coat.

The large bloodvessels are therefore cylindrical tubes composed of several layers of tissues, more especially elastic tissue and plain muscular fibres. One of the important properties is contractility of the vascular wall, by virtue of which the bloodvessels may be elongated or shortened; the diameter of the vessel may be dilated or contracted and the supply of blood to a part altered; this con-

tractility plays no small part in the surgery of the vessels. Their elasticity is great—that is, they offer little resistance, within certain limits, to any force employed to distend or elongate them; if the force be uniform, the bloodvessels rapidly regain their original size and form after the force distending them is removed.

The extent to which the arteries may be stretched has not been accurately estimated. Veins may be stretched 50 per cent. without passing the limit of their elasticity—*i. e.*, when a vein is freed from its adhesions to surrounding tissue 50 per cent. of the distance may be removed and still the vein possess sufficient elasticity to be approximated. From personal observation I have found that a large portion of the carotid arteries could be removed and the ends approximated without difficulty. The internal pressure which a vessel will withstand is very much greater than the normal arterial pressure to which it is subjected, showing that in the process of surgical repair a wall much more feeble than the normal wall of the vessel is sufficient to hold the blood in control. Volkmann found the carotid of a sheep would rupture only when fourteen times the normal pressure was put upon it. The carotid of a dog withstood fifty times the normal blood-pressure, the jugular vein about one-half of this (Greheut and Quinquand). It may be deduced from the above that there is little danger of aneurism at the point of union, even if the walls are somewhat weaker than normal.

Thrombosis and Coagulation.

Blood in direct contact with living, unaltered bloodvessels does not coagulate (Hewson, Brücke). Coagulation takes place within an injured bloodvessel after death of the leucocytes. The action of the paraglobulin on the fibrinogen in solution in the plasma produces coagulation if salts of calcium be present. Paraglobulin is believed to be the product of disintegration of cellular elements of blood, principally leucocytes and blood-plates. Peptones injected into the blood of a dog do not permit of the interaction of lecethin, and thereby prevents coagulation (Wooldridge). Fruend believes that the death of the red blood-corpuscle causes conditions which produce coagulation. He showed that blood collected in glass vessels smeared with vaseline did not coagulate for a long time if decomposition was prevented. Experiments further show

that apparently unimportant changes in the condition of the vessel-wall may cause coagulation; this result is confirmed by the observations of many pathologists. "All observers are agreed," writes Thoma, "that the solution of the red blood-corpusele causes coagulation, although they differ as to the explanation." It is probable that the splitting of the fibrinogen molecule is produced by the nucleo-proteid, and the thrombosin thus formed combines with the calcium; fibrin is a salt of calcium. Albertoni observed that if tryptic pancreas ferment (or histon) be injected into the blood of an animal the blood would not coagulate. The three factors necessary for coagulation are fibrinogen, nucleo-proteid in considerable quantity, and calcium salts. The coagulation is favored by contact with foreign substances of all kinds, but only when it adheres to them. Blood does not readily coagulate in contact with bodies covered with fat or vaseline. Waxed sutures prepared in oxalate of ammonium should therefore be used when the intima of an artery is penetrated. We have been taught that a roughening or irregularity in the wall of an artery would produce coagulation thrombosis. My observations on arteries lead me to believe that this statement is erroneous, and that thrombosis occurs only when a foreign body is left in the artery to which the blood adheres, or where an infection is present with the foreign body, causing the death of cellular elements of the blood. The theory that injuries to the intima *per se* do not produce thrombosis is supported by Porta's observations that thrombosis of the artery was absent in 14 per cent. of the ligations made by him where the intima was injured, and Schumann found, experimentally, that thrombosis occurred in a very much smaller percentage of cases. Senn observed that a clot was not formed on the proximal side of ligatures in veins, but always on the distal side. These show that trauma of the ligature *per se* does not produce coagulation in the vessel.

As a proof that an irregularity in the wall of an artery does not produce thrombosis we have the clinical fact that arteries penetrated by bullets rarely ever thrombose. They almost always form dissecting aneurisms, and there is no tendency to coagulation within the vessel at the seat of the injury nor below that point if sufficient of the wall remains to guide the current of blood into the distal portion. In Case II. of this paper, notwith-

standing that the artery had been completely penetrated by the bullet, leaving the irregular edges of the arterial coat projecting into the lumen of the vessel, there was not the slightest tendency to the formation of a clot within the vessel nor on the ragged edges of the wall. This observation is supported by the clinical course of traumatic aneurisms, and numerous cases may be cited to support this theory—that the roughened edges do not produce coagulation. There is no doubt that even a considerable destruction of the intima does not always cause thrombosis, and that this process is lessened if the caliber of the vessel is reduced to certain limits in accordance with Thoma's histo-mechanical principle. Virchow, O. Weber, Paget, and Billroth believed that after ligation of the artery its permanent obliteration is produced by thrombosis and vascularization of the thrombus, and that tissue-proliferation within it proceeds from the white blood-corpuscles. Rokitansky showed that primary adhesion and definitive occlusion can take place independent of thrombosis. Kocher, in 1869, proved that a ligature with primary adhesion of the endothelium would produce closure of an artery. This was further sustained by Lister, Baumgarten, Raube, and others. Waldeyer sustained the belief that the endothelium and subendothelial layer take an active part in producing adhesion of the wall of the vessel after ligation, that the intima receives its blood-supply from the capillaries of the media, and that organization takes place from the endothelial lining which forms the basis of a new connective tissue.

Searpa, recognizing that the endothelial coat of the intima is a derivative of the mesoblast, as the other serous surfaces, the peritoneum, pleura, pericardium, dura, etc., attributed to it the same physiological properties of regeneration. Its reaction to irritants is very much less than that of the peritoneum and much more than that of the dura, being about midway between the two.

The union between the walls of arteries after ligation takes place more rapidly without the formation of thrombus—that is, a thrombus is a foreign body and retards organic union in arterial approximation, whether with ligature with intent of definitive occlusion or with suture with the purpose of definitive union of the walls. The former was well recognized by Baumgarten. The endothelial cells increase in number, producing long spindle-cells and broad embryonal connective-tissue cells from beneath them (Raab). If

vessel-walls the same as peritoneal surfaces be brought in close approximation after irritation, they adhere primarily through cell-proliferation from the intima by the process of budding of endothelial cells and division of connective cells. The remaining coats of the vessels assist in the definitive organization and vascularization of these adhesions—that is, the media is penetrated by vessels from the adventitia, and capillary loops are formed and joined until organic union is complete.

The subsequent changes in the thrombus are divided into five classes: 1. Hyaline-granular transformation. 2. Organization or replacement by connective tissue and re-establishment of the caliber of the vessel. 3. Calcification. 4. Simple softening. 5. Puriform liquefaction. After an artery has been thrombosed the thrombus may entirely disappear and continuity of the canal be established. Its absorption is produced by the endothelia of the vessel covering the thrombus and the formation of connective-tissue cells. This gradually produces contraction of the thrombus, as shown in Figs. 195, 196, and 197, page 206, Thoma. Vessels from the vasa propria finally penetrate the intima and media of the vessel. Absorption takes place, leaving the vessel patulous and its wall free (Thoma-Heuking).

Ischemia, Collateral Circulation.

If the trunk of a large vessel be sutured and thrombosis takes place at the seat of union, with complete occlusion of the vessel, the life of the part on the distal side will be jeopardized by the interruption in the circulation in proportion to the rapidity with which the circulation is shut off and the rapidity of the establishment of the collateral circulation, which plays an important part in retaining vitality, and which requires time for its development. Permanent occlusion of an artery leads, as a general rule, to a permanent alteration and rearrangement of the vascular system, and generally to the development of collateral circulation (Thoma). After ligation of the main artery of an extremity there is at first a disappearance of pulsation in all the branches. This will remain absent until such time as the circulation is re-established directly through the vessel or by enlargement and development of collateral branches. This can take place with great rapidity after ligation of a large trunk, as of the popliteal and femoral; the return

of pulsation in the large vessels below can occur as early as twenty-four hours in the young, and proportionately later in older persons. The veins play an important *rôle* in the re-establishment of this collateral circulation, so that when the vein and artery are both occluded the danger of death to the extremity is much greater than when only one of them is occluded. Upon ligation of large arteries corresponding to the first and second divisions the vessel on the proximal and distal sides of the ligature contracts within five to ten minutes after it is tied, and remains permanently contracted, showing that the diameter of the artery is independent of the blood-pressure (Thoma). When a bloodvessel is diminished in size the tension on the wall at that point decreases. On the basis of this histo-mechanical principle the invaginating method of the union of arteries diminishes the caliber of the vessel at the position of union, and therefore the tension diminishes while the blood-current at that point increases in rapidity. The resisting power of the wall at the point of invagination is above normal, as the arterial coats are doubled at that point. From a mechanical standpoint the danger of rupture, dilatation, or thrombosis is lessened when the approximation has been made, as the diameter of the vessel at that point is smaller and the current more rapid. Experience shows that the gradual occlusion of a vessel always leads to the development of an increased collateral circulation; even the thoracic aorta comes under this rule. After suture of vessels there is a tendency to endarteritis obliterans. As this process is one of slow formation it is one of minor importance as to the ultimate result of arterial suture. While the endarteritis is occluding the vessel, collateral circulation is being established and the danger of death of the part obviated.

The Effect of Ligature of Large Vessels.

The abdominal aorta has been ligated ten times; one patient survived ten days after the operation. The common iliac has been ligated sixty-eight times (Lidell), with only sixteen recoveries, a mortality of 76.5 per cent. In thirty-one cases of ligation of the femoral artery for aneurisms hemorrhage occurred in eighteen—*i.e.*, 60 per cent., and was fatal in twelve, or 40 per cent. (Ballance and Edmunds)—a mortality somewhat less than that of ligation of the common iliac, which is 67 per cent. Kammerer collected twenty-

eight cases of ligation of the femoral vein; gangrene occurred in two. In twenty-two cases of ligation of femoral vein and artery, gangrene followed in twelve. In 178 cases of ligation of the artery alone, gangrene occurred in twenty-five.[1] Billroth, in 1871 and 1872, found that he had secondary hemorrhage in from 50 per cent. of large vessels ligated in continuity. Of 106 cases of aneurism of the common carotid collected by Wyeth, with ligation on the proximal side of the aneurism, sixty-seven recovered, a mortality of 35 per cent. In ligation for aneurism of the external carotid, according to statistics collected by the same author, there were seventeen recoveries and five deaths, a mortality of 22 per cent. For aneurisms of the common carotid alone the death-rate was 44 per cent. Lipp collected 130 ligations of the external carotid; only two died as a result of the ligation, and these from extension thrombosis. In ligations of the internal carotid 13 to 18 per cent. succumbed to brain lesions (Fenger, Lyons, 1894).

The necessity of suturing arteries and veins depends upon their individual importance to the tissue on the distal side of the injured part—that is, we are called upon to suture arteries and veins only in cases in which, by their obliteration, there would probably be a necrosis or impairment of the vitality of the tissue supplied by them to such an extent that its normal functions would not be performed. Therefore, in the upper extremities we shall not be concerned with the arteries below the brachial; in the neck, not above the common carotid; in the abdomen we are concerned with injuries to the aorta, renal, splenic, hepatic, and iliac vessels. The greatest need for arterial suture exists after injury to the so-called terminal arteries, but they are the least accessible.

The Extent of Arterial Resection.

I found that more than one inch of a calf's carotid could be removed and the ends could still be successfully invaginated with sutures. The vessels are very elastic, and when separated from surrounding tissues can be stretched to quite an extent. In dogs three-fourths of an inch could be readily removed and the vessel approximated and sutured. I believe the endarteritis in some of my experiments was caused by the stretching of the vessels and

[1] New York Medical Journal, May 10, 1891.

by denuding them of their connective tissue to such a large extent in order to elevate them. In many cases three inches of a vessel were freed from all connection before the hemostatic forceps were applied. From my observations I cannot believe that a vessel can be repaired with safety where more than three-fourths of an inch is removed, except possibly in the popliteal space, Scarpa's triangle, or in the axillary space, where the position of the limb can be made to relieve the tension of the vessel.

The Technique of Arterial Suture.

For convenience I will divide these experiments on the arteries into four classes: 1. Longitudinal incision. 2. Transverse or irregular wounds involving not more than one-third of the circumference of the artery. 3. Transverse sutures involving more than one-half of the circumference of the artery. 4. Complete division of and resection of the artery not exceeding three-fourths of an inch.

The points to be considered in the technique are: 1. Complete asepsis. 2. Exposure of the vessel with as little injury as possible. 3. Temporary suppression of the blood-current. 4. Control of the vessel while applying the suture. 5. Accurate approximation of the walls. 6. Perfect hemostasis by pressure after the clamps are taken off. 7. Toilet of the wound.

The arterial wall and its endothelium are products of the mesoblast, the same as the peritoneum, and react excessively to irritation, but much more slowly than the peritoneum. Infection must be assiduously avoided, as we have not only the regenerative action of the vessel-walls interrupted, but also the action of the cellular elements of the blood forming a thrombus in their efforts to prevent the admission and advancement of sepsis in the vessel. If we have a suppuration outside the wall of the vessel we may have a penetration of the infection to the inner wall, and a thrombosis, failure of union from infection, or necrosis of the vessel when it is exposed to the action of the pus-germs, as shown in Case I.

The vessel-wall should be thoroughly exposed and the field prepared. The loose connective tissue should be freed with scissors and dissecting forceps for the required distance above and below the site of operation. If the operation be for a dissecting aneurism, it is well to expose the vessel above and below the tumor so

as to control the hemorrhage; then open the aneurismal sac, remove the clot, expose the injured wall of the vessel, freshen the edges of the wound, and suture.

Control of Hemorrhage during Operation.

I find this is best accomplished by a delicate eight-inch Billroth forceps with a broad blade and graduated catch. The blades are first covered with a rubber drainage-tube to prevent them from injuring the vessel; the forceps are closed just sufficiently to control the hemorrhage and hold the vessel in the correct position for approximation. If these forceps are not at hand, a heavy twisted-silk ligature may be used for the purpose; it must not be tied so firmly as to fracture the intima, and is best secured with a loop-knot, so as to be readily removed when the operation is completed.

The Control of the Vessel while Applying the Suture.

The best instrument to use is a small rat tooth catch forceps used by oculists, known as the fixation forceps. The intima should never be clasped with the forceps. The ordinary hemostatic forceps should not be used in any place on the vessel, as it fractures the coats. The adventitia is sufficiently strong to control the vessel during the operation, and is all that is necessary to be included in the fixation forceps.

Accurate approximation of the edges of the wound may be accomplished with needles and suture-material. The former should be the same as are used by ophthalmologists and known as the full-curved, sharp and round conjunctiva needles. The straight "floss needles"—sizes 6 to 10—are very serviceable in experiments on the limbs or neck when the artery can be thoroughly exposed. The ordinary cambric needle may, however, be used, or, better, a fine cambric needle with an elongated eye. The suture-material which I found most serviceable in my experiments was twisted silk. The needle and silk should correspond in size, so that the opening made by the former may be filled by the latter. Effort should be made in suturing lateral openings to have the sutures enter only the tunica adventitia and media, the tunica intima being avoided, as advised by Jassinowsky. The sutures should be inserted every one-sixteenth or one-twentieth of an inch; they should be interrupted; should enter the vessel one-sixteenth of an

inch from the margin of the wound, and should not include the tunica intima. The reason for not penetrating the intima is not the danger of hemorrhage, but of the endarteritis and obliterating thrombosis that might follow.

The ordinary double knot should be used, not too firmly tied. When the wound is transverse or irregular, care should be exercised in inserting the needle in parts that belong directly in apposition to each other. If one-half or a greater division of the artery be incised, the first suture should be inserted in the middle of the incision, then one at each angle.

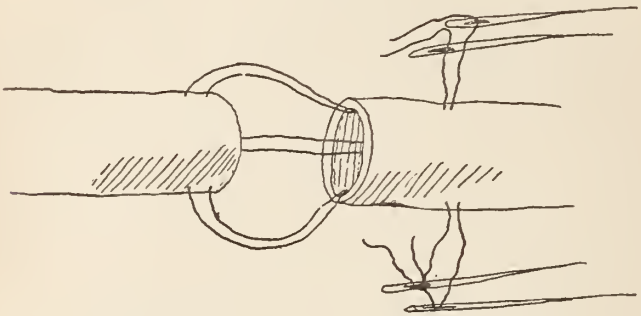
After the sutures are all inserted the compression forceps should be removed from the distal side first. If there should be hemorrhage from the needle punctures, a compression with the fingers or sponge for from one to three minutes will be sufficient to control it, as a small thrombus forms in each puncture. When it is possible after the approximation is completed it is advisable to suture the sheath of the vessel, muscle, or fascia over the line of union, to give it additional support.

The field of operation should be thoroughly cleansed after the operation is complete, and a gauze drain inserted. In bullet-wounds the bullet should be located and removed, as it might be a source of infection. An accurate approximation should then be made of all tissues with buried catgut suture. The drain should be removed in forty-eight hours.

Jassinowsky's experiments were confined to incised and irregular wounds involving not more than one-half the circumference of the vessel. I found that when more than half the vessel was destroyed it was not advisable to suture the edges end-to-end, but to make a resection of the injured portion of the vessel and produce an end-to-end union by invagination. The sutures are inserted, as shown in Fig. 11; two or three double needled threads are prepared and inserted into the end of the proximal portion, including only the two outer coats. These are reinserted at regular intervals one-third to one-half inch above the end into the distal part, from within outward; the threads are then tied, and this invaginates the artery. In order to facilitate the invagination a small incision is made parallel to its long axis, extending from one-fourth to one-third of an inch; then four or five interrupted sutures are inserted into the intussuscipiens, binding it to the surface of the intussus-

ceptum, the suture in the latter entering only the tunica adventitia and media. By this method we have secured a large surface contact of vessel, the proximal portion of the artery being inserted into the distal. The arterial blood-pressure tends to press the walls closer, thus preventing hemorrhage and favoring definitive union. By this method of approximation fewer sutures are necessary to secure blood-proof apposition.

FIG. 11.



Method of insertion of sutures in Experiment XXXIII.

In experiments it is important to use large-sized vessels, as the lumen of small ones is apt to be filled by a thrombus. The work is delicate; the vessels must be handled with all possible care, as every injury to the intima means inflammatory reaction for repair.

The veins may be subjected to the same treatment with better results.

The indications for operation are:

1. Injuries to large vessels in operation.
2. Injuries to large vessels from stab, puncture, bullet, or lacerating wounds.
3. Traumatic and dissecting aneurisms.
4. Sacculated, fusiform, and arterio-venous aneurisms.

In the first class of cases—*i.e.*, injuries to large vessels in operation, the injury to an artery, if less than two-thirds of the circumference be involved, should be immediately repaired by suture. If more than two-thirds of the circumference be injured, the division should be made complete and the invagination method used for approximation, care being taken that the invaginating sutures do

not penetrate the tunica intima of the invaginated portion; that the external sutures do not injure the intima and are first inserted in the invaginated portion, parallel to the long axis of the vessel, and then inserted in the overlapping end. (See Fig. 11.) By this method the circumference of the artery is not diminished as it is when the suture is inserted transversely to the arterial axis. The sheath should be carefully sutured over the artery, as it gives additional support; and if the general field of operation should suppurate, the line of union would thus be protected from infection. The field of operation should always be temporarily drained, as a blood-clot prevents primary adhesions. When the edges of the arterial wound are ragged they should be freshened and clean cut before the suture is inserted.

In the second class of cases—*i.e.*, injuries to large vessels from stab, puncture, bullet, or lacerated wounds—the primary hemorrhage, as a rule, is not excessive, particularly when caused by bullet-wounds, except when the abdominal aorta or renal vessels are involved, as the tissues are irregularly torn and overlap each other in such a manner as to prevent the escape of blood and favor the formation of aneurism. Therefore, we have ample time to make proper preparation for the suture of the vessel. The wound may have existed for weeks or months with the dissecting aneurism and still be amenable to suture, as the opening in the vessel itself enlarges but little with time, the aneurismal sac being formed from the surrounding tissues and laminated coagula. (See Fig. 12.) The technique of suture in this class of cases is the same as in the first after the aneurismal sac has been enucleated and the opening in the vessel has been exposed and separated from its attachment to the wall of the aneurism.

In the third class of cases—*i.e.*, traumatic aneurisms of long standing, we have the best variety of cases for arterial suture. The opening in the artery is usually small, the arterial wall is healthy, and a sufficient quantity of aneurismal stump may be retained to produce a firm line of approximation. (See Fig. 12.) From a theoretical standpoint as well as from the result of experiments there is no danger of the formation of aneurism at the point of primary suture for injuries, and should not be for secondary suture as in aneurisms of this class. The vessel should be exposed above and below the aneurism, and temporary hemostasis

obtained by a very mild compression forceps. The aneurismal sac should then be freely opened and dissected down to the position of the opening in the artery. The edges of the opening should be freshened and closed, the same technique being observed as in primary suture.

In the fourth class of cases—*i.e.*, sacculated, fusiform, and arterio-venous aneurisms—the aneurismal sac should be exposed and dissected down to the position of the healthy coats of the artery (Figs. 13 and 14), where it should be amputated, leaving sufficient of the aneurismal coat and arterial wall to allow a row of sutures involving one-sixteenth of an inch of the margin on either side, so that when the suture is complete the size of the vessel will be below its normal calibre. This lessens the arterial pressure of the vessel at that point, and there should follow a union of the walls. Care should be taken not to produce an approximation of arterial surfaces covered with coagulated laminæ. A study of the aneurismal varix (Figs. 13 and 14[1]) shows how the aneurismal sac may be amputated or removed from the opening in the artery and the communicating canal closed by sutures; also Warren's case.[2] The same can be said of Roland's case.[3] As the longitudinal suture of arteries has been so successful experimentally, little doubt remains that it can be more successful clinically, as asepsis and antisepsis can be more effectually carried out.

Following are reports of two cases in the human subject:

Case I.—Carl A. B., American, aged thirty-three years, married, a salesman, received a bullet-wound in the left Scarpa's triangle (22-calibre ball) at 2 o'clock in the afternoon of October 4th. He was taken to the County Hospital, where I saw him at 6.45 the same evening. The man had profuse hemorrhage from the wound before he was brought to the hospital. There was considerable puffing for four inches below Poupart's ligament; there was no pulsation nor bruit in this swelling. The left posterior tibial artery pulsated synchronously with the right, and was of the same force and tension. It was believed from these conditions, rom the position of the wound and the severity of the hemorrhage, that the femoral artery was not injured by the bullet, but that the vein was probably punctured.

[1] Treves' Surgery, p. 634. [2] Boston Medical and Surgical Journal, May 30, 1890.
[3] Bryant's Surgery, p. 316.

Fig. 12.

Small opening originally made in the artery, and the large aneurismal sac.

Fig. 13.

Arterio-venous aneurism. Showing the small communication between artery and vein, with marked enlargement of latter.

Fig. 14.

Small opening between artery and vein, with large expansion of vein.

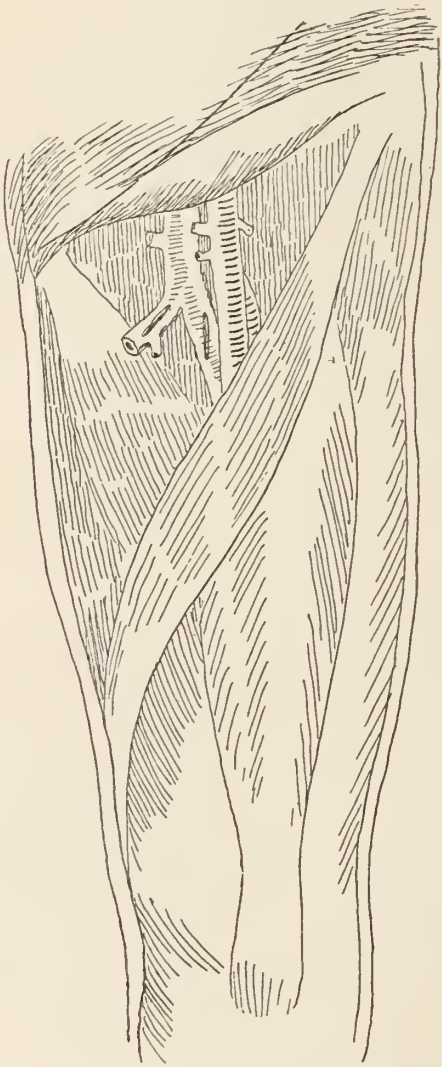
Operation. An incision five inches long was made, extending downward from Poupart's ligament parallel with the femoral artery. The internal saphenous vein was exposed and found to be perforated. An opening existed on its anterior and posterior surfaces, the bullet having passed through the middle. These were sutured with a continuous silk suture, No. 8 floss needle. The dissection was continued, and the common femoral vein exposed and found injured. The femoral vein had an opening on its anterior surface three-fourths of an inch above the junction of the profunda, and on its posterior surface one-eighth of an inch above the vena profunda femoralis. (Fig. 15.) It was difficult to control the hemorrhage, as the blood returned through the vena profunda when the clamps were placed upon the femoral vein above and below the wound. It was soon found that the posterior opening could not be exposed without dividing the profunda. A double ligature was placed on the profunda, and it was divided between. The posterior surface of the vein was now turned forward and the opening closed with a continuous suture as above. After this was completed the clamps were removed and a little blood escaped from the posterior inferior angle of the wound in the vein; after the insertion of an additional suture in the angle the hemorrhage ceased. The femoral artery had a fragment of tissue torn off the side of its sheath, but the vessel-wall was not injured. The bullet was not located. The vein-wall was split by the bullet, no part of it being carried away —the usual result of a bullet-wound of a vein. There was not a drop of blood escaping from either of the veins when the compresses were finally removed. The field of operation was sponged out with a 5 per cent. solution of carbolic acid, the wound closed and the leg elevated. No drainage.

The greatest difficulty in the operation was experienced in exposing the posterior surface of the common femoral vein on account of the close relation of the wound to the vena profunda.

The patient's temperature began to rise after the operation, and on October 8th had reached 104°. The wound was opened and a gauze drain inserted. The temperature gradually dropped, and by October 12th was below 100°, and remained below 100° until November 6th, when it reached 101°. November 7th, in the morning, 102.2°. The wound had been suppurating all the time, although the external opening was almost closed. On the

morning of November 7th there was considerable hemorrhage, which was believed to be due to suppuration of the sutures in the

Fig. 15.



Point of perforation of internal, saphenous, and femoral veins.

vein. On November 8th temperature 102°, pulse 130, and more bleeding. November 9th, pulse 144, temperature 100°. Patient

was coughing and expectorating a bloody mucus. On November 10th I saw the patient for the first time in a week; his temperature was then 101.6°, and his pulse 104. Examination revealed a large swelling of the upper third of the thigh; the tension of the tumor was very great; blood was oozing from the small opening which still remained, and a dark clot could be seen inside the opening. There was no pulsation in the swelling. It was not auscultated. Patient was anesthetized, the opening enlarged, a clot four inches in diameter was shelled out, and in the bottom bright arterial blood flowed per saltum into the wound. Digital compression controlled it until the field was entirely cleared. The inner side of the femoral artery for one inch was eroded and had a number of perforations. It was carefully dissected out, about one and one-half inches were resected, a single ligature placed on the distal and a double one on the proximal end. The cavity was cleansed and drained. The femoral vein could not be located. Some fragments of the femur which had been broken off by the bullet were removed.

Since November 27th the patient has been doing very well. There has been no disturbance of the circulation of the leg, and the cavity is almost closed. December 8th: There is a very small sinus remaining. Patient is in excellent condition. The infection was probably produced by the bullet, and the continued suppuration favored by the fragments of bone.

January 4, 1897. Patient completely recovered; no edema and no disturbance of circulation of leg.

CASE II.—H. V., Italian, peddler, aged twenty-nine years. Shot at 11 o'clock September 19th. Was brought to the hospital two hours later.

Clinical history. The patient was shot twice, one bullet passing into the abdominal wall just above the greater curvature of the stomach, without penetrating the abdomen; the other entered Scarpa's triangle below Poupart's ligament. There was no bruit at this point nor increased pulsation noticed at the time the patient was admitted to the hospital. I saw the patient first October 4th. Examination revealed a loud bruit; it could be heard with the ear placed six inches from the thigh. There was no tumor and but a slight increase in pulsation. The pulsation in the popliteal, dorsalis pedis, and posterior tibial arteries

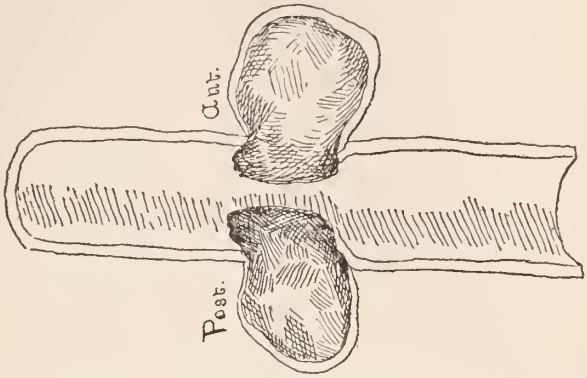
was scarcely perceptible. I examined the case again on October 6th and demonstrated it to a class of students. A thrill could be felt and a bruit could be heard. The latter was the loudest to which I had ever listened. The pulsation, though very feeble, could now be felt in the dorsalis pedis, but not in the posterior tibial.

Diagnosis. Penetrating wound of the common femoral artery about one and one-half inches below Poupart's ligament. It was decided to cut down and expose the artery, and if a penetrating wound of more than one-half of the circumference was found, to make a resection and unite it end-to-end.

Operation, October 7, 1896. An incision five inches long was made from Poupart's ligament along the course of the femoral artery. The artery was readily exposed about one inch below Poupart's ligament. It was separated from its sheath and a provisional ligature thrown around it, but not tied. A careful dissection was then made down along the wall of the vessel to the pulsating clot. The artery was exposed one inch below that point and a ligature thrown around it, but not tied. A careful dissection was made upward to the point of the clot. The artery was then closed above and below with gentle compression clamps, and was elevated, at which time there was profuse hemorrhage from an opening in the vein. A cavity about the size of a filbert was found posterior to the artery, communicating with its caliber, the aneurismal pocket. A small aneurismal sac about the same size was found on the anterior surface of the artery over the point of perforation. (Fig. 16.). The hemorrhage from the vein was very profuse, and was controlled by digital compression. It was found that one-eighth of an inch of the arterial wall on the outer side of the opening remained, and on the inner side of the perforation only a band of one-sixteenth of an inch of the adventitia was intact. (Fig. 17.). The bullet had passed through the centre of the artery, carried away all its wall except the strands described above, and passed downward and backward, making a large hole in the vein in its posterior and external side just above the junction of the vena profunda. (Fig. 18.). Great difficulty was experienced in controlling the hemorrhage from the vein. After dissecting the vein above and below the point of laceration and placing a temporary ligature on the vena profunda, the hemorrhage was con-

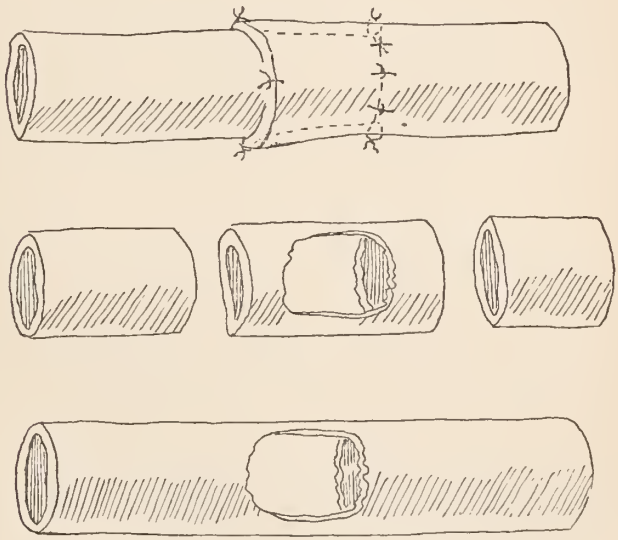
trolled so that the vein could be sutured. At the point of suture the vein was greatly diminished in size, but when the clamps were

FIG. 16.



Aneurismal pockets on anterior and posterior surfaces of femoral artery, from Case II.

FIG. 17.

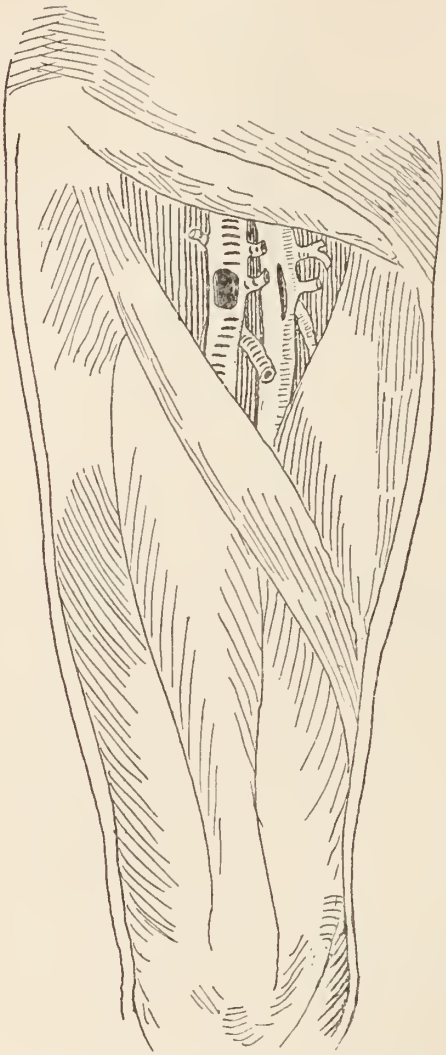


Degree of destruction, portion resected, and appearance after invagination of femoral artery in Case II.

removed it dilated to about one-third the normal diameter, or one-third the diameter of the vein above and below. There was no

bleeding from the vein when the clamps were removed. Our attention was then turned to the artery. Two inches of it had

FIG. 18.



Position of perforation of femoral artery and vein in Case II.

been exposed and freed from all surroundings. The opening in the artery was three-eighths of an inch in length; one-half inch

was resected and the proximal end was invaginated into the distal for one-third of an inch with four double needled threads, which penetrated all the walls of the artery, as shown in Fig. 17. The adventitia was peeled off the invaginated portion for a distance of one-third of an inch. A row of sutures was placed around the edge of the overlapping distal end, the sutures penetrating only the media of the proximal portion. The adventitia was then drawn over the line of union and sutured. The clamps were removed. Not a drop of blood escaped at the line of suture. Pulsation was immediately restored in the artery below the line of approximation, and it could be felt feebly in the posterior tibial and dorsalis pedis. The sheath and connective tissue around the artery were then approximated at the position of suture with catgut, so as to support the wall of the artery. The whole cavity was washed out with a 5 per cent. solution of carbolic acid, and the edges of the wound were accurately approximated with silkworm-gut sutures. No drainage.

The time for the operation was approximately two and one-half hours, most of that time being consumed in suturing the vein. The artery was easily secured and sutured and the hemorrhage from it readily controlled. The patient was placed in bed, leg elevated and wrapped in cotton.

A pulsation could be felt in the dorsal pedis on October 11th, four days after the operation. There was no edema of the leg and no pain. The circulation was good—continuously from the time of operation. The wound suppurated. Drainage was inserted, but at no time did the patient's temperature exceed 100.8°. December 8, 1896, the circulation is perfect; the wound has healed with the exception of a small, superficial ulcer one-third of an inch in diameter. The patient has not had an unpleasant symptom since the operation.

January 4, 1897. Patient is walking about the ward of the hospital; has no edema and no disturbance of the circulation.

10*th*. Patient discharged from the hospital, recovered.

I desire to thank Dr. W. A. Evans for the microscopical work, and Dr. E. H. Lee for assistance in the experiments.

DISCUSSION.

The President.—How about the vessels in the peritoneum? Would it make any difference?

Dr. Murphy.—You have to depend upon the suture of the wall of the vessel itself.

Dr. W. G. Macdonald, of Albany.—Dr. Murphy's paper has been very interesting to me. There are limitations to the employment of the method; but if we can only resort to it, particularly in relation to some of the surgery of the axilla in our completed operations for extirpation of cancers of the breast, where we uncover things pretty thoroughly, and it is not so uncommon to tear into a vessel, it will be a good thing. In certain accidents associated with dislocation of the shoulder, such as traumatic aneurism, if we could employ some method of this sort, a large number of limbs might be saved. It is, as Dr. Murphy has shown, largely in the experimental stage. Just how the healed surfaces in arteries will behave themselves after a period of months under intra-arterial pressure is a matter to be considered, whether or not we may not have following the method, particularly in those cases where invagination has been employed, the condition of aneurism. It seems to me very reasonable that the scar tissue which we make in closing a wound, even in the long axis of a bloodvessel, might very readily give way on account of the continued pressure to which it is subjected. Dr. Murphy's experience in civil practice in the wounding of large vessels from bullets, which we can close up, is rather unique. Do you remember, doctor, what was the nature of the bullet wounds? You spoke of two vessels having been wounded.

Dr. Murphy.—One wound was made by a bomb thrown during the Haymarket riot in Chicago, and the other bullet wound was made by a 32-calibre revolver. The popliteal was ligated, and I saw the case two days afterward.

Dr. Macdonald.—I have noticed that revolver wounds do not produce much injury unless within short range. The history of the war of the rebellion shows that the number of large vessels that were wounded was small. Dr. Murphy's method is certainly one which presents a number of interesting features to us, and it is another department of surgery in which we can only hope Dr. Murphy may be as successful in suturing wounded arteries as he has been in the development of methods of mending the intestines.

Dr. James McFadden Gaston, of Atlanta.—I would ask Dr. Murphy whether, in his experimental work, he has tested at all the effect of pressure on the cardiac side of these injured vessels when attempting their restoration, thereby lessening the impulse of the blood against the portion of the vessel that has been wounded or that has been divided for experimental purposes? All of us, no doubt, have had the opportunity of watching the effect of this measure in our work in regard to aneurisms. While it lessens the force of impulse of the blood, it does not materially favor thrombosis beyond the point at which the pressure is used. All of my own efforts in treating aneurisms by compression have failed in obliterating the aneurisms, and I have invariably had to ligate to control the aneurism. In such cases the method Dr. Murphy has advocated would come into play in a very satisfactory manner. The surgeon could suture the artery, or probably produce junction of the artery, by fastening the upper into the lower portion of the artery by division of its edges and suturing them together and by lessening the impulse for a few days or weeks, which might materially promote the object of restoring the coats of the vessel.

Dr. W. E. B. Davis, of Birmingham.—I did not get here in time to hear all of Dr. Murphy's paper, but I cannot help believe, from what I gathered from the remarks that have been made, that much is going to be accomplished by this method. To be sure, the surgeon has done no harm if he fails, because the collateral circulation will take care of the case, and he has everything to gain. It is a line of work I propose to take up in an experimental way.

Dr. Joseph Hoffman, of Philadelphia.—I cannot help contrasting the line of work Dr. Murphy is doing in reference to the salvation of arteries which are to save parts that are useful, with that which has for its object the devising of new methods to sacrifice parts that are possibly diseased. This is work in a line that at once bestows credit upon the man who conceives it; it benefits those who listen to it; it is an honor to the Association where it is given birth, and I wish we had more of it.

Dr. Murphy (closing the discussion).—In answer to Dr. Gaston's question, I will say that I have not made any experiments in that line to lessen the current. I would say, however, that the great drawback is thrombosis, and if our former theory of lessening the current favored that, it would be contraindicated here. The danger is not from hemorrhage, much to my surprise. When I began the work I felt the danger would be from hemorrhage, on account of the results of Glück, which are given in my paper, as well as the experiments of others.

Bullet wounds of the popliteal artery, which are probably most dangerous to the limb, and which were referred to by Dr. Macdonald, are very important. Of nine bullet wounds of the popliteal artery reported by von Bergman, and observed during the Russian war, gangrene of the leg occurred in seven. This impresses on us how desirable it is to re-establish the circulation in the popliteal artery.

CONTUSIONS OF THE ABDOMEN.

A Report of Cases, with Conclusions.

By WILLIS G. MACDONALD, M.D.,
ALBANY.

The treatment of contusions of the abdominal region associated with visceral injuries is an important problem. The question of surgical intervention, although frequently discussed, cannot be regarded as satisfactorily settled. Surgery has not definitely established any series of symptoms or conditions which is an inflexible guide to interference, unless the presence of septic peritonitis is regarded as an indication for operation. A series of personally observed cases, terminating almost uniformly fatally, has led to a careful study of reports and the conclusions reached by different surgeons. I cannot trespass by giving any extended tabulation of the important factors in the clinical histories of the cases, but must content myself with such generalizations as are derived from analysis of the material placed at my disposal. The detailed histories of the following cases are given as briefly as admissible for the purpose of illustrating definitely the limits to be defined in the subsequent paper.

Case I. *Rupture of the jejunum; death in sixteen hours; autopsy.*—A. J. R., aged twelve years, fell from a stage, a distance of five feet, immediately arose, complained of abdominal pain, but stoutly maintained that the wheel did not strike him. He was seen soon after the injury and a careful examination made. His pulse and temperature were normal, and there was no sign of abdominal injury save some tenderness and tension in the umbilical region. The pain was entirely relieved by the administration of one-eighth grain of morphine. The evidences of severe injury were so slight that he was allowed to ride to his home in the suburbs. Later in the day vomiting occurred, and the child passed rapidly

into a state of collapse, and died during the night without further medical attendance. At the autopsy the jejunum was found entirely separated from the duodenum, the free intestine being torn from the fixed. There was free extravasation of blood and intestinal contents in the abdominal cavity. Death occurred in this case before any serious inflammatory reaction occurred. Subsequently it was learned from a passenger that the forward wheel of the coach had passed over the abdomen.

Case II. *Rupture of the stomach, contusion of liver, intraperitoneal hemorrhage, septic peritonitis; death; autopsy.*—Mr. J. G. R., aged twenty-nine years, a farmer by occupation, and in vigorous health, was injured by being struck in the abdomen by the pole of a wagon while attempting to stop a runaway team. He was knocked down and the team and wagon passed over him. There was no history of a wheel striking him. He was able to rise without assistance, complained of sharp pains in the abdomen, but accompanied the other laborers to the field. Shortly afterward he vomited the contents of his stomach (a recently eaten meal), complained of faintness, was taken home in a wagon, and went to bed. He was described by his wife as very pale and covered with cold perspiration. The vomiting, slightly streaked with blood, continued during the night. He was given freely of ice water for his thirst. A physician was called, who gave an anodyne, left a mixture for nausea, and ordered hot fomentations. I saw him thirty-six hours after the injury. He was in collapse, covered with cold perspiration, subnormal temperature, pulse 160 and very feeble, vomiting continuously, and very restless. Urine had been voided naturally. There had been no movement of the bowels. On examination there was no sign of any external violence. The abdomen was distended, very tender, with a board-like resistance of the muscles. There was dulness in the flanks. The liver-area was resonant. Although freely stimulated, he died in a few hours.

The autopsy revealed the conditions already detailed. There was a lacerated wound of the anterior wall of the stomach, an inch and a half in length, through which much food and fluids had extravasated. The hemorrhage came from vessels torn in the gastro-celiac omentum. The peritonitis was general and septic.

Case III. *Rupture of the ileum, peritonitis; death in eighteen hours.* J. H. F., aged thirty-six years, a ship-chandler by occu-

pation, was injured while wrestling. The history given was that Mr. F. and several companions, after drinking freely of beer, had a wrestling match, in which he was heavily thrown. He complained of abdominal pain, but soon started for home, walking several blocks. After arriving home he went to bed and called his physician, who gave a very clear account of his condition. He was suffering severe pain in the abdomen, without shock; was tender over right side of abdomen; had vomited. His temperature was normal, and pulse 36. A hypodermatic injection of morphine was given, and fomentations ordered. During the night he grew rapidly worse, and I was asked to see him by his physician early the following morning. When we arrived for consultation, at 9 A.M., he was dead. An immediate autopsy was made and a transverse tear in the ileum found. Aside from the early evidences of a virulent peritonitis, the intestines were otherwise healthy. The abdomen was half filled with effusion and liquid feces. There was no sign of contusion in the abdominal wall.

CASE IV. *Contusion of the abdomen, rupture of the small intestines; death; autopsy.* —J. B. S., aged forty-nine years, by occupation a carpenter, was injured by a board being thrown from a planer, striking him in the abdominal region. He immediately complained of severe abdominal pain and vomited. There was no sign of contusion in the abdominal wall. His pulse was 90 six hours after the injury; the abdominal walls were tense and very sensitive. Hot fomentations were applied and anodynes given. His condition grew progressively worse, and I saw him in consultation on the third day after the injury. At that time he was in the last stages of septic peritonitis. The absence of liver-dulness was the only distinguishing symptom. No operation was undertaken. An autopsy made the following day revealed multiple rupture of the intestine.

CASE V. *Rupture of the ileum, septic peritonitis; autopsy.*— C. P., aged twenty-five years, a laborer by occupation, was kicked in the abdominal region by a horse. The physician called to see him recognized the serious nature of the injury and ordered his removal to the Albany Hospital. On admission the following day his pulse was 100, temperature and respiration were normal. He complained of severe abdominal pain. Aside from a small contusion, there was no external evidence of injury. The following

morning his pulse was 90, but some abdominal distention was now observed. Pain still continued despite liberal doses of morphine. The distention continued to slowly increase, and two days later vomiting occurred. Bowels remained constipated, although repeated efforts by means of enemata were made. His pulse and temperature now began to rise, all the symptoms became more alarming, and he died four days after the injury. Autopsy: abdomen markedly distended. On entering the peritoneal cavity, peritonitis at its height found. Free pus and fecal extravasation in the cavity; lymph was found attached to the coats of the intestines, and coils of them glued together by means of plastic lymph. A darkly congested area of small intestines, almost gangrenous, was traced out, and a perforation of the ileum found.

Case VI.—W. F., aged thirty-seven years, a motorman by occupation, was thrown from the front platform of a trolley-car about 7.30 P.M. The distance fallen was not more than five feet. He received a considerable scalp-wound, and complained immediately of severe abdominal pain in the region of the umbilicus. His pulse, respiration, and temperature were normal. There was no local sign of abdominal injury. During the night he received a grain of morphine, hypodermatically injected, for the relief of his abdominal pain. Early the following morning his pulse was 84, temperature 100°. At 9 o'clock his pulse was 96, and the patient had vomited a pint of brownish matter. His pulse continued to rise, and at 10.45 was 120 and irregular. Symptoms of profound shock now presented themselves. At 12 noon the abdomen was opened and two perforations of the ileum found, which were closed by Lembert sutures, after which the abdomen was thoroughly flushed with normal salt solution. The patient rallied slowly from the shock of operation. His condition became favorable and continued so for a week. During this time the quantity of fluids allowed him had been somewhat curtailed; but on the night of the eighth day after the operation the patient got up out of bed in the absence of the nurse, walked some distance to the faucet, drank as freely of water as he wished, and returned to bed without assistance. Shortly afterward he was taken with severe pain in the abdomen, went into a condition of collapse and died. At the autopsy a perforation was found at the seat of a slight abrasion noticed at the time of the operation. It is apparent that had

the patient conducted himself properly there would have been little doubt of his ultimate recovery.

Case VII. *Rupture of cecum; operation; recovery.*—J. W. D., aged nineteen years, a barkeeper by occupation, was suffering from an obstinate constipation, associated with impaction of the cecum. His physician applied himself with considerable energy to the administration of large enemata, the patient being in the knee-chest posture. During the adminstration of one of these enemata the patient was seized with great pain and went into a condition of collapse. I saw the patient within an hour. The diagnosis of intestinal perforation was made, and the patient immediately sent to the hospital by ambulance. An immediate abdominal section was made by the right lateral incision. On division of the peritoneum extravasated liquid feces and fluid poured out. A tear in the cecum an inch long was found and closed. The abdominal cavity was freely irrigated, drained, and closed. The recovery was slow but complete. No ulceration of the cecum was found at the operation.

The investigation from an etiological standpoint of lacerations of the digestive tube reveals much that is important. There is nothing more remarkable than the slight degree of violence necessary to produce rupture of the stomach or small intestine. The physical signs of contusion are rarely to be observed in the abdominal walls. Slight falls, as out of bed, striking the abdomen against a chair, or a smart blow from the handle of a barrow, have been known to produce fatal lacerations. Again, under other circumstances, serious blows have been followed by little inconveniences.

Injuries received shortly after the ingestion of a full meal or after partaking freely of liquids are much more serious than those received when the intestinal canal is empty. A smart blow over intestines distended by fluids is associated with an explosive action. The phenomena observed are similar to those seen when a bullet penetrates a closed vessel filled with fluid. The more distended loops of intestines always suffer most from direct blows, such as horse-kicks. On the other hand, in wounds produced by wheels passing over the abdomen the movable portions of the intestines are torn from the fixed portions, a common illustration of which is the tearing of the first portion of the jejunum from the duodenum.

The portions of the digestive tube injured, in order of frequency, are the small intestine, the stomach, the large intestine. The injuries are: complete laceration (most common); partial laceration or contusion of the abdominal coats, without extravasation of the contents, but with great danger of subsequent ulceration and perforation; and laceration of the mesentery involving the integrity of the circulation in the intestine. Allingham reports a case of laceration of the mesentery parallel with the intestinal wall. The wound was repaired without resection, but the patient died subsequently from the intestinal gangrene at the seat of injury.

Lacerations of the stomach are more rapidly fatal than those of the small and large intestine. The element of hemorrhage is always an important one in determining the degree of collapse observed.

Manifestly the most important thing in connection with abdominal contusion is the diagnosis or exclusion of visceral injuries. Thomas Bryant has very properly called attention to the difficulty attending diagnosis. It seems to depend upon the careful and early consideration of the following factors: history of the precise nature of the injury, shock or collapse, pain, vomiting, and physical signs.

Shock or collapse occurs in 20 per cent. of the cases, and is an early symptom, yet its absence may lead to serious error. In a very considerable number of cases of rupture of the small intestine it has been entirely absent for some hours after the injury. Again, how common it is to see a patient in profound shock after a blow over the stomach, and from which he rallies in a few hours, little worse for the experience! Shock appearing some hours after the injury is always a grave symptom, usually indicating the onset of violent inflammatory reaction or hemorrhage. I may be allowed to use the phrase "increasing shock" to describe a condition where, under the most approved treatment, the patient continues to sink and dies in a few hours. In increasing shock internal hemorrhage is always to be expected. The hemorrhage has its source not only in the solid viscera, but from the vessels in the omentum and mesentery. My attention was recently called to a very careful clinical report of a case of ruptured spleen treated by operation with recovery. This report was ideal in its directness and brevity. The whole clinical history covered only four hours

—an injury to the abdomen, great pain, no external sign of violence, half-hourly examinations, increasing shock, rapidly rising pulse, a progressively extending area of dulness, operation at the end of the second hour, removal of spleen and clots, saline transfusion, slow reaction, recovery. Had the surgeon in this case waited for reaction no operation would ever have been done. It is through operation alone that increasing shock can be arrested.

Pain is a constant symptom in visceral injury. It is, as a rule, generally disseminated at first, and is so variously described by patients that there is nothing pathognomonic in the variety. However, a distinct tendency to become localized at the seat of injury has been frequently observed. Pain is always a relative symptom —described by one as agonizing; another does not seriously complain. It will be found, however, that morphine will be almost invariably required as a temporary and humane expedient, but not to be repeated without great circumspection. The writer recently saw a patient, the third day after a horse-kick in the abdominal region, who had received a fourth grain of morphine every two hours since the injury. The patient was and had been comfortable, but he died in a few hours. The autopsy revealed septic peritonitis due to extravasation from multiple openings in the ileum. Here the free administration of anodyne had so masked the true condition that both physician and relatives were quite unprepared for the fatal termination. As a general rule, if pain is not quite fully relieved by a half-grain of morphine in the first twelve hours after the injury, immediate exploratory incision is to be seriously considered.

There are few signs of intra-abdominal mischief more constant than vomiting. As associated with grave injuries to the viscera, it has been rarely absent. It may be considered as early immediately after the injury, and late after the onset of inflammatory symptoms. The contents of the stomach and duodenum are usually promptly ejected after the injury. The vomited material may contain blood. A number of cases of rupture of the stomach have been reported when blood was not seen in the vomited material. Where vomiting is persistent from the first the condition is always grave; it is another indication for early exploration.

The temperature and pulse have been carefully recorded in many cases. In common with all experiences in abdominal surgery, the

temperature-chart has been of little assistance to the surgeon. A rise of temperature about twelve hours after rupture has been a rather constant symptom, and has some diagnostic value.

Immediately after abdominal contusions the pulse may be slower than normal, fifty or sixty to the minute, but inhibition soon gives way to paralysis, and the pulse becomes progressively higher and more feeble. In a personal case I have seen it rise from 80 to 140 in four hours. Such a progressive rise is an indication for early exploratory incision, quite imperative in itself, and of great value as a factor in the symptom-complex. The pulse, in rare instances, may lead to error. The writer did a late operation in a case of ruptured ileum with purulent peritonitis and obstruction, the pulse being only 88 when the patient was placed on the table. That the increased pulse-rate may not be as pronounced as desired until the favorable time for operation is long past is not to be forgotten.

The physical signs found upon examination have been very variable, depending upon the nature of the injury and the time when the examination was made. Unfortunately the results of the early physical explorations are either not given in many cases, or they were seen at a period so remote from the injury that they could not be determined.

There is no more striking condition than the absence or very slight external evidence of injury. During the war in the Crimea two accurate autopsies were made on soldiers killed by the "wind of a cannon-ball." There were no signs of external injury, yet the abdominal viscera were reduced to pulp. Therefore the conclusion that no serious injury can have occurred, since there are no external signs of it, is at once fallacious and dangerous.

Palpation is more valuable. The early appearance of local or general tension of the abdominal muscles is always an important physical sign, and its presence is always to be investigated with much care. In my own cases it has always been present, at least directly over the injured viscera. The tension is associated with exquisite local tenderness. Dulness is rarely present in the first twenty-four hours, except in cases of hemorrhage, yet a systematic investigation for it is always to be made. As a late sign, if localized, it is a favorable one, indicating the attempt of nature to limit the disease by plastic exudation. On the other hand, it may

indicate the presence of blood, bile, or septic effusion. The late physical signs are those of a general septic peritonitis, and require no extended notice at our hands. The one sign of rupture of the intestinal canal—disappearance of the area of liver-dulness—is sufficiently constant to be of much diagnostic value. Yet it does not appear until infection has become so generally distributed that operation offers little hope for recovery. No one would feel justified in waiting for its appearance before undertaking an operation for suspected perforation. It is cure, not diagnosis, that is important.

The importance of the early use of the catheter cannot be overestimated. The presence of blood in the urine is an important symptom. A pint of sterilized normal salt solution passed into the abdominal cavity through a ruptured bladder can do no harm, and leads to immediate operation for the repair of that condition, increasing thereby manifold the chances for recovery.

Any injury to the abdomen, associated with immediate visceral lesions of sufficient size to permit of extravasation or considerable hemorrhage, is followed by a fatal termination so uniformly that the exceptions are not to be seriously considered in prognosis. All cases of recovery under the above conditions are open to criticism of doubtful diagnosis. Out of one hundred and fifty-eight carefully tabulated cases, only seven recovered without operation where the symptoms or physical signs would reasonably warrant the diagnosis of perforation. Of fifty-one operations reported since 1880, there have been twenty recoveries and thirty-one deaths. Many operations were undertaken at a time when operations seldom reflect much credit on surgery. By comparison, abdominal section in contusion of the abdomen stands precisely on the same ground that it does in gunshot- and stab-wounds, with the only difference that in gunshot- and stab-wounds the indications for operation are more immediate and imperative. As much or more extravasation may occur from a lacerated intestine as from a perforated or incised one. Yet the mortality in gunshot- and stab-wounds is much less simply because the indications for early operation are more distinctive. At the present time, in gunshot wounds in the abdomen, immediate exploration is the rule, and better results are attained. In contusions of the abdomen a policy of delay obtains, waiting for symptoms to develop, until general septic peri-

tonitis supervenes. The early operative interference in gunshot-wounds marked the period when the mortality became greatly lessened. The early surgical interference in blows upon the abdomen associated with visceral injury will mark the beginning of an epoch of life-saving.

The whole matter resolves itself in diagnosis. Can the history of the nature of the injury, the symptoms and physical signs, together establish sufficiently presumptive diagnosis to warrant an exploratory operation? The mortality following a simple abdominal exploration in the hands of a competent surgeon is very small; it will scarcely exceed 1 per cent. In view of our past experience in the treatment of abdominal contusions, is it not better to open the abdomen on well-founded suspicion than to await the development of symptoms indicating conditions over which surgery has little control?

Fully appreciating the conditions of the problem, I approach the determination of a symptom-complex associated with abdominal contusions which demand an immediate celiotomy. This symptom-complex depends for its integral factors upon the following points: first, history of the injury; second, the symptoms, pain, shock, vomiting, constipation, and pulse; third, abdominal tension, tenderness, dulness, and distention. Not all of the symptoms which have been already considered are to be observed in every case, but sufficient will be present to warrant, upon careful analysis, an exploratory abdominal section. Explorations undertaken during the first twelve hours following injury have yielded very flattering results. Operations undertaken after the onset of septic peritonitis have given very little encouragement to surgery. The cases in which no lesions were found at early operations have been very few and never followed by death. It will bear repetition that when unmistakable diagnosis of intestinal rupture is established in contusions of the abdomen, irreparable damage through septic infection has too often occurred. Operation before peritonitis is the art of success.

In the technique of operation there is little that is special to the condition. The abdomen once open is similar to that for penetrating wounds. The control of hemorrhage, by ligature, clamp, cautery, or tampon, is the first consideration. The systematic

examination and repair of injuries follow in order. Principles of surgery already understood apply to every condition. Cleansing the peritoneum by irrigation and subsequently drying, or by sponging alone with suture and drainage, completes the operation. A free incision after the preliminary exploration greatly facilitates subsequent manipulation and saves valuable time.

Surgeons will be compelled to undertake operations in shock. Waiting for reaction can no more be permitted here than in a ruptured tubal pregnancy with progressive hemorrhage.

DISCUSSION.

Dr. J. B. Murphy, of Chicago.—Mr. President: I want to congratulate Dr. Macdonald on his excellent paper; but I also want to condole with him on the fact that we are in such a hopeless condition in this class of cases as to diagnosis. It is difficult to make a diagnosis sufficiently accurate to act in time. I have had a considerable number of these cases, but I only recall one that recovered, and that was in a man who was kicked in the scrotum where he had a hernia, and it ruptured. The hernia was reduced, the contents of the intestine escaped into the abdomen, but the peritonitis was circumscribed in one corner of the abdomen. The man was operated on early. In the majority of cases I have had, the operations were done early, and still the patients died.

On the diagnosis I have nothing to offer that is tangible. I have found no symptom upon which I could absolutely rely. I will relate the last case I had. A man fell four stories, and thought he had a rupture of some of the abdominal viscera. He had intense pain in his abdomen; he vomited; there was no blood in his urine, and I felt that the following morning the young man would be dead, as he had the appearance of one who would die at almost any time. The next morning he was all right, and has been so ever since.

There is only one thing I would ask Dr. Macdonald to leave out of his paper when he publishes it, and that is the admission of one dose of morphine. The doctor will do me a personal favor if he will leave that out of the paper; not that it is not right for him to give it, who has an extensive experience in this class of cases, but it is a bad example for general practitioners. Bryant, in the spring of 1865,

sounded the same note of warning, and, notwithstanding the fact that more than thirty years have passed since then, morphine has been abused thirtyfold more than it was at that time. Morphine given in a disease of the abdomen is damnable; it covers all signs, takes away the warnings of nature that there is something wrong, and I believe it should be abolished in this class of cases, along with the probe and the urethral catheter.

Dr. I. S. Stone.—Suppose the patient has been taking morphine?

Dr. Murphy.—Cut it off just the same. It will obliterate peristalsis if the man has perforation of the bowel, and Dr. Macdonald brought out that point in his remarks regarding examination of the abdomen for physical signs. If the patient has perforation of the bowel he has obliteration of peristalsis, which is one of the most positive signs of intestinal perforation. If you give him morphine he has obliteration of peristalsis, and this sign is absolutely wanting. I have operated early in my cases. I remember two gentlemen who were attending the Post-Graduate School in Chicago, one of whom was kicked in the abdomen by a horse. I said I believed, by the expression of the face, there was a rupture of the bowel. Temperature was 99°, pulse was good, and forty-eight hours after the injury the physicians said they could not see how I could come to such a conclusion. We anesthetized him; feces escaped into the abdomen, and he had diffuse peritonitis, and died shortly after operation.

The same is true of bullet wounds. In these the indications are positive. In a bullet wound of the abdomen the surgeon is not justified in allowing the patient to go regardless of the symptoms. The symptoms are not of much value in the early part of the cases.

Dr. Edwin Ricketts, of Cincinnati.—The essayist made the statement that during increasing shock in this class of cases an operation should be done. We have abroad in this land many physicians who teach that an operation should not be done in these cases until shock is overcome. A more disastrous teaching cannot be perpetrated upon a profession, and it is just on this point, as expressed by Dr. Macdonald, that I wish to say a few words. Those of us who are doing this work know what we have to contend with, as so many of the cases go into the hands of the general practitioner, who perhaps will not favor operation until shock is overcome. I desire to raise my voice against the teaching, recognized all over the country, that an operation must not be performed while shock is on. As Dr. Macdonald has expressed it, the best thing for cutting short the shock is an operation.

The President.—Good surgery is the best thing possible to guard against shock. Short anesthesia, with little ether, usually strengthens

the heart and pulse, and is the very best treatment we have ever had for shock.

Dr. I. S. Stone, of Washington.—I want to ask the essayist about vomiting in rupture of the stomach. I once had a case of rupture of an old cicatrix in the stomach in a man who was undergoing an attack of grip. He had vomited for several hours, and of course had previously a history of ulcer of the stomach. During an attack of vomiting he was seized with pain, and all the symptoms of nausea ceased. I have not heard of a similar case being described. This is the only case I have had. The sudden cessation of the vomiting attracted my attention, and I report this case with the hope that Dr. Macdonald may throw some light on it. The patient died in twenty-four hours of peritonitis.

Dr. D. Tod Gilliam, of Columbus.—I am not an obstructionist. I believe in abdominal surgery, and all that; but I think we are in danger of going too far in this business. It has been my lot to see a number of cases of abdominal wounds and contusions, and I recall now several cases in which there was seemingly every indication for immediate operation. Had it been mine to determine I should have operated, but I was overruled by counsel, and the result was the patients got well. In one case the man had fallen fifty-four feet from the mast of a vessel, was greatly shocked, and had evidences of internal injury. He recovered, resumed business, went to another place, and fell seventy-two feet on a sand pile through an elevator shaft. This was only a few months since, but he is all right now, and was a few days since in my office for life-insurance examination.

On several other occasions I have known men who had received kicks in the stomach, with very distressing symptoms, but they recovered without any trouble. I remember when I was located in a coal region we used to have strikes, during which there was usually considerable shooting. A number of cases of gunshot-wounds fell into my hands. One man was shot through the stomach, as evidenced both by the point of impact of the ball and the vomited matter, which contained blood. He recovered without operation. Another man shot himself in the bowels. This was in Columbus. I was very anxious to operate, but was restrained by the family physician. He recovered in time. I have seen so many cases get well without operation that I look upon it as a dangerous policy for every physician to make an exploratory incision in cases of abdominal injury. While it might be a proper thing for Price, Macdonald, Murphy, or any of the gentlemen present, I should be loath to sanction it as an established rule of practice. I believe in the hands of less experienced men the mere making

of a small incision in the abdomen would not make much difference, but if such have to search for rupture of the internal viscera, and probably manipulate the parts extensively, I think the death-rate would be enormously greater than it would be under more conservative methods. I wish it to be distinctly understood that I object to exploration only as a wholesale measure, and by men who are not qualified by special training.

Dr. Hugh T. Nelson, of Charlottesville (by invitation).—As I understand it, we are discussing the operative treatment of contusions of the abdomen. A gentleman from Kansas City severely rebuked me on one occasion for not making surgical interference in a case of gunshot-wound of the abdomen, in which I was confident three hours after the accident that the viscera were injured. I am satisfied that in cases of gunshot-wound of the abdomen or of severe injury of the abdomen, where the symptoms indicate that there is injury to any viscus, in every community there is probably someone who has had sufficient experience to open the abdomen with safety to the patient. It seems to me under these circumstances it is absolutely criminal to delay operative interference. My experience has not been very extensive, but I am sure from my observation of injuries of the abdomen, and particularly of gunshot-wounds, that even a surgeon of small experience should not hesitate to incise the abdomen, carefully examine the contents, and, if necessary, repair the lesion. I am sure the contents of the viscera extruded into the abdominal cavity, under antiseptic and aseptic precautions can be removed, the lesions repaired, and the life of the patient saved in many instances, even though Providence does come to the relief of those not interfered with.

The case I refer to was shot on the Chesapeake and Ohio Railroad, was placed in my hands, and I at once advised operation. Operation was delayed until the family physician could arrive. I told him delay would be fatal. At his request we held a consultation with other physicians, and because the ball had entered the anterior surface of the abdomen and made its appearance under the skin, near the spinal column, they seemed to think that in all probability the man had not received a wound of the viscera. Shock had entirely passed away. The patient had no elevation of temperature, and was apparently progressing rapidly. There was a peculiar odor about the character of the discharge, which indicated to me that the small bowel was injured, and I insisted upon early operation. The physicians in consultation refused to confirm my diagnosis of injury of the viscera, and when the family physician arrived the patient seemed to be in excellent condition. Some sixty hours afterward he began to decline, when the

physicians argeed upon operative interference. I said, "Gentlemen, it is too late now, but we will take the chance on saving the life of the patient." I made an incision in the abdomen, and found that a small knuckle of the intestine had been penetrated by the ball, and the contents of the viscera had poured out into the abdominal cavity. General peritonitis set in, and in the course of forty-eight hours the man was dead.

Since that time, in such injuries of the abdomen, I have advocated early operation, because I believe in ninety-nine cases out of one hundred serious results are to be expected, unless surgical interference is resorted to.

Dr. W. E. B. Davis, of Birmingham.—I am extremely interested in the subject of contusions of the abdomen, for I regard it as one of the most difficult ones that we have to solve. It is in such cases that we have a large field for exploratory incision. Exploratory incision in abdominal surgery now has a very limited field, because, while we may not be able to make a sufficiently accurate diagnosis in intra-abdominal affections to say just what the condition is, we can make it sufficiently accurate to know that there is something within the abdomen that we should remove. But in the class of cases under discussion this is not possible, and I have taken the position for some time that in all cases of severe injury to the abdomen, with or without symptoms, that it is safer for the patient to have an exploratory incision. It will not do to wait for symptoms. We all know in the most severe abdominal injuries from gunshot-wounds that the patient will walk about in a large per cent. of cases, and yet, if we do not operate on them within twenty-four hours, nearly all of them will die. Only a small per cent. can be saved after the first day, and it would require that much time for symptoms to develop. In every case of gunshot-wound where the abdominal wall is penetrated, the abdomen should be opened, and in those cases where the injury from contusion is great it is wise to operate. This is not the class of cases that brings surgery into disrepute if no injury is found. The surgeon is not liable to lose the case if there is no injury, and if he should lose the case the injury is regarded by the laity as the cause of death.

Dr. Macdonald emphasized one important symptom in these cases—the rigidity of the abdominal muscles. It is one of the most valuable signs we have in abdominal operations. Wherever there is injury to the intra-abdominal viscera we will find rigidity of the muscles over that region. It is almost an infallible sign. On that account morphine should be withheld, if possible. In every case where morphine is required an operation should be done regardless of symptoms.

As to the use of morphine—this is drifting somewhat from the discussion—I cannot believe that an occasional hypodermic injection causes the harm in abdominal surgery that some would lead us to believe. Yet it is necessary for the abdominal surgeon to interdict its general use and to speak strongly on that subject in these meetings, in order to prevent its abuse. As soon as the surgeon has made a diagnosis the patient should have a hypodermic, and he should not allow the improved condition to prevent him from operating. The patient is thus saved three or four hours' suffering, and is better able to stand an operation.

Dr. Murphy.—Do I understand from what Dr. Davis has said that he would give a hypodermic in those cases in which it is not intended to operate immediately?

Dr. Davis.—No, sir; never. But in every case of abdominal injury where the surgeon has made up his mind that the abdomen ought to be opened.

Dr. Joseph Hoffman, of Philadelphia.—I wish to call attention to one point, and illustrate it by the citation of two cases that have come under my notice, and that is, there may be a serious injury with apparently only slight symptoms produced.

I was called in consultation some time since to see a man who had been working in a rolling-mill. He was as healthy a specimen as I had ever looked at. When I saw him I said he was dying, and I told the doctor there was no use in trying to do anything, as the man was in collapse. I elicited the history of the case, and learned that he had been working the night before, had been playing in the mill with two or three of his comrades, stepped aside quickly and struck himself in the abdomen with the handle of an iron grate, but not so much as to knock him out. He resumed work, but died the next night. I made a post-mortem examination the next day, found perforation and the abdomen full of blood.

The other case was a friend of mine with whom I taught school. He had recently been married, and was building a house. He climbed a ladder to look at some workmen, and in coming down he was within two rungs from the bottom when his foot slipped; he fell and struck his belly. In twelve hours he was dead. A post-mortem examination revealed rupture of the liver. He fell less than three feet.

In reference to the cause of shock in these cases, the injury that is found after an accident does not seem oftentimes to explain the shock. If one gets a severe blow on the abdomen with a boxing-glove it will give the sensation of having a belt around him as tight as it can be

drawn, and the abdominal muscles will stiffen up like a board. It is an unpleasant sensation.

Another point showing the extent of abdominal shock; I see it constantly in slight forms of exercise. After repetitions of the lightest possible taps with a padded glove on the abdomen, a man wants to quit in about ten minutes. He is not hurt, although there may be some redness of the skin. He feels just as though a man had hit him in the jaw and knocked him out. There is a peculiar effect upon the sympathetic nerves by the impact on the abdomen, and it must be attributable to the disturbance of the solar plexus. The man does not seem to be injured, but this form of exercise will play the strongest man out without hurting him. In all probability it is this effect, in a major degree, that produces the great amount of shock which we notice in these cases.

Just a word in answer to the remarks made by Dr. Gilliam. The doctor has been unfortunate, I think, in seeing so many cases get well without operation. His experience is not uniform with that of others, and if he cites these cases as data upon which surgeons should act, we should look at the other side of the question, and see how many men die because they are not operated on. One class will very much outweigh the other. When abdominal section is advised and consented to, it should be done carefully, accurately, and upon strict surgical principles, just as any other surgical operation should be done, and I am quite sure if it is done by such a man as Price or Macdonald there will be no cause for regret.

Dr. James McFadden Gaston, of Atlanta.—I have a peculiarly interesting case to report, or I would not tax your time with any general remarks I might be able to make on this subject. It was a case in which I was called in consultation by Dr. J. B. S. Holmes, at his infirmary in Atlanta. A young man received a violent concussion by falling off a platform in some building operations, and the fall produced such an impression by the violence received in this way as to communicate the shock to the whole abdominal viscera. We found a fracture of the ramus of the pubic bone, with rupture of the urinary bladder, and as a final result there was also rupture of the gall-bladder. It was for the gall-badder injury that Dr. Holmes concluded to call me in the case. The accident occurred at Gadsden, Ala. Dr. Holmes had been called to the case in conjunction with someone else, and afterward the man was brought to Dr. Holmes's infirmary, whether prudently or not is not a question to be considered now. Dr. Berlin, of Chattanooga, found that the man had some indications of urinary infiltration in the perineum and adjacent parts of the pelvis. A perin-

eal section was made opening into the bladder, and drainage established, and at the time I saw the patient there were no longer indications of infiltration of urine, the operation having served its purpose. The evidence of the gall-bladder being involved consisted of some local tumefaction and tenderness about that region. There was some indication of tension over the whole abdominal region. Considering the extent of the injuries the man had sustained in other respects, it being then ten days after the accident, I did not advise an exploratory operation to verify the fact of rupture of the bladder. I had quite recently a case in which I suspected rupture of the bladder had occurred, that recovered under general treatment. So that, with this case staring me in the face, I played hands off with reference to operative measures.

The man of whom I spoke lived for a month, and finally died in a state of great emaciation At the post-mortem we found that the gall-bladder had disintegrated almost completely from the profound shock received at the time of the accident. There was an abscess in the right lumbar region extending almost the whole way along the psoas muscle line, and there were some indications of pus in the pelvis independently of the psoas abscess. I doubt very much whether any operative interference in this case could have availed anything. The case shows the extent of the complications which may occur in the abdominal region in connection with shock.

My personal experience with reference to injuries of the abdomen have been in that class of cases in which I have not verified actual rupture of the intestine. Those cases which I have been enabled to diagnosticate as severe contusions without rupture have been treated upon general principles with satisfactory results.

I probably may expose myself somewhat by saying that I belong to the small minority of the profession who coincide with Dr. Davis in reference to the use of morphine in abdominal derangements. I am sure in the cases I have had to treat of injuries of this kind, after giving a laxative to open the bowels, I have received material benefit from the use of morphine upon emptying the intestinal canal. I do not, nor cannot, think that in the condition of the bowel such as occurs in cases of this kind, that increased peristalsis can be serviceable. I am as definitely fixed in my ideas of the indications for morphine as Dr. Murphy is in his indications against it.

Dr. Macdonald (closing the discussion).—The seven cases which I have reported occurred within the last three years. They came to surgeons who are particularly associated with practice in general hospitals, where men with all kinds of injuries are brought in by the ambulance. The difficulty in the management of this class of cases and

the great mortality led me to the investigation. I took the *Index Medicus* as far back as 1879, went carefully through it in English, German, and French, and, with our own State Library in Albany, I traced 200 cases, tabulated them, got their histories together, the nature of the injuries, the amount of shock which occurred, the pain, vomiting, pulse and temperature, and the physical signs. I looked over the whole material carefully, studied it, and compared it with the seven cases which I have seen so recently, thinking I might be able to arrive at something whereby it will satisfy us to make an exploratory laparatomy in these cases, yet I must confess to you that I am in the position which Dr. Davis so clearly put—that it is not the symptoms for which we operate largely, but the history of the nature of the injury done.

I cannot agree with Dr. Murphy in the matter of morphine. I am as much opposed to the repeated and systematic use of morphine in peritonitis as any surgeon. I am sure of that, but it is a part of my teachings to a class in minor surgery. In ambulance surgery I say to the class that in very severe cases of injury, before you put on a temporary dressing, give this man one-quarter of a grain of morphine with one hundred and eightieth of sulphate of atropia. In the first place, it relieves shock. In the second place, it is a humane thing to do. I would not, after receiving a horse-kick, like to lie around for three-quarters of an hour without any morphine, particularly if my intestines were ruptured. I would want that one-quarter of a grain of morphine at once. I would not discuss the propriety of an operation with anybody until I had it.

For five years—yes, for ten years—we have been discussing the use of morphine and opium in the treatment of peritonitis. When I visit the different towns of the State of New York I find that general practitioners are giving morphine and the deodorized tincture of opium just the same as when I first commenced to practise. They do not believe us. That is the truth of the matter. They listen to us in these meetings, read our discussions, and go away. They have faith in the old plan of treatment. I have a sort of despair of breaking general practitioners from giving morphine. I put the question directly to them, and my example is good enough. But, after all, they continue to use it.

As to the matter of increasing shock, which has been spoken of, I have seen too many patients with crushed legs from railway accidents brought into the hospital and transferred to a room under the care of a nurse, and left to recover from shock sufficient for operation. I have assisted in removing some dirty, mangled limbs, and then two days

later have helped to make the autopsies. I believe that with care employed in the use of saline transfusion and strychnine, with a good warm operating-table and plenty of blankets, we are justified in operating immediately in severe injuries of the abdomen. Even if it be a hip-joint amputation, we are more likely to save patients and lessen the chances of infection.

UNNECESSARY AND UNNATURAL FIXATION OF THE UTERUS, AND ITS RESULTS.

By JAMES F. W. ROSS, M.D.,
TORONTO.

Woman's uterus is an organ of peculiar mechanical construction. There is no other organ in the human body similarly constructed, and the same organ in other animals resembles, in a marked degree, the human uterus. It is constructed as it is to perform a peculiar function. This womb that has been occupied by all mankind, gynecologists included, is fixed below and unfixed above. The lax and partial support of two guy ropes, the round ligaments, can scarcely be called fixation. The fundus moves forward at the command of a distended rectum, and backward at the dictum of a distended bladder, and to one side or the other in order to oblige a small intrapelvic growth that may be growing beside the uterus. If a woman be placed on her head the fundus will swing back and forward in a line like the reverse of that described by the pendulum of a clock. There is no doubt a very good reason why the Creator created woman with an unfixed uterus, and he who attempts to fix the uterus attempts to improve the handiwork of the Creator. He infringes one of the mechanical laws of nature.

The uterus is only a childbearing organ. By childbearing we mean conception, subsequent growth, and extrusion of the new being into the world. The latter, the extrusion of the fetus, is provided for in a masterly manner; the plan is as perfect as man or God can make it, and if this plan is interfered with by the meddlesome gynecologist it becomes at once imperfect. The little back bendings and front bendings of this mobile organ would scarcely be noticed if woman was unendowed with a nervous system.

From time to time we have our professional house-cleanings. New thoughts creep into the professional mind and for a time engage its attention. We have been led to believe that nearly all

diseases of women may be cured by cutting the cervix; by stitching the cervix; by hot-water douching for so-called pelvic cellulitis; by excessive removal of normal ovaries; and finally by removal of the poor organ that has been left behind, as the symptoms have not given way to other treatment adopted. And now, latterly, we have been asked, on all occasions when opportunity affords, to fix the backward and reclining uterus. One set of operators are prepared to form a new ligament that the Creator forgot to insert; another set of operators, while they believe that certain symptoms are produced by an exaggerated retroflexion of the uterus, ask us to relieve this condition by the production of an exaggerated anteflexion. Our house-cleaning is not yet completed. We have to improve one chapter in our works on gynecology—the chapter that represents a most indefinite, mythical, and unscientific remnant of the past. It is the chapter on forward and backward displacements of the uterus. I have always felt that the more frequently I perused this chapter the less information I obtained. To me it was always a slough of despond. It is possible to make the symptoms of a great many diseases agree with the supposed symptoms of these terrible displacements. It is fortunate for man, who has so much liver, that he has no uterus.

It is not my intention to become either a uterine milliner or a uterine carpenter, but I am certainly a gynecologieal heretic. The milliner suspends from above, the carpenter props from below. I do not like the work ; to me it has always been unsatisfactory. If we were all better physicians much of our gynecological thunder would be lost. There is altogether too much indefinite statement of facts. The ideas of a nervous woman are not to be relied on when searching for scientific facts on which to base our knowledge. We must ask ourselves this question : " Do these displacements of themselves give rise to the terrible array of symptoms with which they are credited ?" I believe not. Let us take for a moment an almost daily experience. A young growing woman is working hard at school. She is run down in health, and her muscular system is impaired for want of muscular exercise. The sexual organs are developing; bad habits may be contracted, as in boys, that put a great strain on the nervous system. She is examined by a doctor who, having graduated from our modern schools, has become imbued with the idea that anteflexion, anteversion, retro-

flexion, retroversion, are necessarily accompanied by a long list of symptoms. He at once discovers what he considers an abnormal condition and institutes treatment that is entirely unnecessary. The patient then, with her mind fixed on the one idea that she has womb disease and is not as she ought to be, is required to make frequent visits to his office to submit to the placing of glycerin tampons, lamb's-wool tampons, pessaries, to undergo the abuse of the curette, and to pay a large account. She finds that each visit to the office makes her worse, and, after having settled the account, goes elsewhere. She then, fortunately for herself, meets with one of the old-fashioned physicians, who knows more of physic than of gynecology, and he endeavors to assure her that she is a perfectly healthy woman as far as her sexual organs are concerned. He looks further than the uterus, investigates all the surrounding circumstances thoroughly; he unravels the case, leaves the uterus alone, and cures the patient.

Some, however, are not so easily persuaded that there is not some latent disease lying hidden in the depths of the pelvis. They have become firmly convinced that they are sexually deformed, and positively refuse to treat with anyone who does not discover some disease of the intrapelvic organs. In our large cities the unruptured hymen is unfortunately becoming rare, owing to the fact that supposed womb disease has become alarmingly prevalent among young women.

A short time ago a young gentleman consulted me regarding his marriage with a young lady who was then occupying a sick-bed in a Michigan sanitarium. He said that he was tired waiting, and that he did not believe there was much the matter with his affianced, but that she was being humbugged. I advised him to send her word that she must marry him now or never. She had been in bed for nearly twelve months. Within the first month after marriage he brought his wife to consult me. She was complaining of sickness of the stomach. I concluded that she was pregnant. Within nine months her first child was born. Conception thus occurred in the presence of a supposed flexion, endometritis, and ovaritis for which she had been undergoing treatment.

I have at present under my care a young woman suffering from "that tired feeling." She was examined by a doctor, who discovered that her disease lay in a bent uterus. A pessary was placed,

and, owing to its effect on the imagination, answered for a time, but a new sensation developed in her brain. She was now sent to a consultant, who found more than the flexion: he found disease in one ovary, and to cure the patient took out the one ovary and performed the operation of hysterorrhaphy. This answered nicely for a time, but a new sensation developed in the patient's mind, and she concluded that the other ovary must be at fault. The consultant was persuaded to agree with her, and it was also removed. The consultant died and the patient drifted into my hands. Having heard that the want of success of the two operations was due to the fact that the uterus was left behind and that many most eminent men were advising its removal, she decided that to recover her health her uterus must be removed.

On examination I found a tiny organ, atrophied, as they so frequently are subsequent to the menopause. It was now no larger than my thumb. After gaining her confidence and convincing her that her pains were the result of a disordered nervous system, I induced her to undergo a strict routine by way of treatment—to rise at a certain hour, to walk for a certain length of time, to rest for a certain length of time, to submit to massage, to eat at certain hours, to read certain works and only for a certain length of time each day, to avoid seeing friends, and to sleep eight hours every night. She is now able to walk several miles, and is like a different being, although a ruined woman, as she is unmarried and has lost her ovaries. She had thoughts of marriage, but gave them up, thinking that she could be nothing but an invalid wife when she found herself in the possession of so many pelvic diseases. In this case I suspect onanism.

In many of these cases the true facts regarding secret habits are concealed, and while concealing these facts they may persuade the surgeon to perform operations that are unnecessary and useless. I advise all such cases not to postpone marriage until after health is regained, because, unless this is done, the supposed infirmity will continue and marriage will never be consummated.

I have given a great deal of careful thought to the treatment of cases of flexion and version in young women. Anteflexion is said to be the normal position of the uterus; I find a large number of cases in which the uterus is retroflexed. On some occasions the uterus will be found apparently in a condition of retroversion, with

a bladder full of urine, and after the urine is drawn off the organ is found to be in its normal position. If the examination is made in a hurry the conclusion is come to that the patient has a retroversion. The same is true in regard to the absence or presence of fecal matter in the rectum, and outside of these two factors—namely, a full bladder and a full rectum—there is some other factor that produces a variation in the position of the uterus. I have been surprised to find on one occasion the uterus occupying a position much further toward the sacrum than it did on the occasion of my former examination. The position of the uterus seems to vary with increased fulness of the intestines. We have all noticed this change in position when the drainage-tube is in the cul-de-sac of Douglas and the abdomen becomes partly distended subsequent to a laparatomy. If lateral displacements give rise to no symptoms when the uterus is pressed far toward one side or the other by an intrapelvic growth, it seems peculiar that backward flexion should be endowed with such ill consequences.

In young women the treatment of the flexions will not cure the patients, except in exceptional cases. I have placed a tiny pessary in a woman with normal sexual organs, complaining of all sorts of ailments, and have had her return at stated intervals to have the pessary removed and replaced, and have gained her undying gratitude for what she considered my skilful treatment of her case. I have seen others who complained of terrible bearing-down pains when a small pessary, that could have no effect on the rigidity of the pelvic floor, was removed, and have seen them completely relieved from these pains by the replacement of the pessary. Pessaries may, therefore, have a very great effect on the mind. Patients and physicians may both be somewhat touched with "pessary mania."

After the operation for oöphorectomy became fashionable one doctor in a small town in the South managed to extirpate fifty or sixty pairs of normal ovaries in one year. Alexander's operation then became fashionable, and a large number of operators found a large number of cases in which the operation was deemed advisable. Ventrofixation and vaginal fixation then became fashionable, and one student who, three years ago, left a Toronto college and settled in an American city in the West, has already succeeded in finding ninety-four poor women who have been patiently await-

ing his advent and who have now their uteri fixed up in front, where he thinks they ought to be. Operators have managed to perform some eight or nine hundred of these operations on this continent alone within five years. I venture to predict that the operation will be almost unheard of at the termination of another decade, owing to the fact that it is, as Mann, of Buffalo, has said, physiologically and anatomically unsound.

In my hands the operation of nephrorrhaphy for the fixation of movable kidney has not been satisfactory. This has also been the case with other operators. Drs. Poullet and Vuillet found that the kidney would not remain fixed without the introduction of a buried suture, and, as buried sutures are suited for application neither to the kidney nor uterus (with one exception),[1] they devised a method of introducing a portion of the living tendon of the long dorsal muscle of the back through the kidney, to grow in its new position and act as a ligament. Unless some such structure is used adhesions will eventually give way until the organ that is being supported rests and ceases to drag on the adhesions.

That there are no recurrences of retroflexion after the performance of hysterorrhaphy I do not believe. I do not believe that there are as few recurrences as are stated by many of the operators. It is difficult for any operator to follow up even a century of women. There is not an operator present who can follow up and obtain particulars regarding the condition of one hundred women on whom he has performed one hundred consecutive abdominal sections. Many relapses have been reported to me personally by friends who have suspended the uterus by one or other of the various methods, and in many of those in which a relapse could not be said to have taken place the symptoms were not relieved. To gain a *clientèle* from which to select a large number for the performance of suspension of the uterus, it must be necessary to include a large number of the vast army of grumblers and clinic trotters who are never satisfied and never cured, whose disease is more imaginary than real.

To perform a series of operations without a death should be an easy matter. A thousand abdomens can be opened with a thousand recoveries, if nothing more serious is done than the stitching of a clean uterus or its cornu to the parietal peritoneum and closing

[1] See note page 413.

the wound. There is no filth to be encountered in the shape of pus, and there should be scarcely any traumatism. The operation is one that any novice in abdominal surgery should be able to perform. The question is not one of mortality or case of performance; but the question is, Is the operation necessary or useful, and does it break no law of nature?

Is the operation without the buried suture capable of producing lasting fixation of the uterus? From my experience with nephrorrhaphy and supravaginal amputation of the uterus by the *serre-neud* for the removal of fibroid tumors, I contend that these adhesions will give way until the uterus rests again against the sacrum or floor of the pelvis.

Within a month a case has been reported and a diagram shown of a uterus fixed by ventrofixation eighteen months before. It was found suspended by a ligament two and a half inches long. The position in which it was fixed forward was not the normal position, so, therefore, the uterus, in its attempt to resume the normal position, fell away from the anterior abdominal wall two and a half inches until it rested. If necessary, for the purpose of securing a resting-place, it would no doubt have gone six or ten inches or a foot, and the so-called ligament would have been six or ten inches or a foot long.

In the light of modern experience of the difficulties met with in cases in which the buried suture has been placed and subsequent pregnancy has occurred, it becomes almost criminal to use a buried suture without removing a portion of each tube to prevent subsequent pregnancy. Fixation by buried suture endangers the woman from an early miscarriage, and endangers her later, should the pregnancy proceed, by producing a thickening of the uterine wall that impedes the natural progress of labor. Adhesions produced by mere freshening of the surfaces or temporary introduction of removable sutures can, like all other adhesions, easily be overcome by the process of stretching incident to the enlargement of the pregnant uterus and movement of the abdominal muscles. Those who have operated two and three times on the same patient, and who have kept accurate records of their cases, must admit that adhesions present at the first operation have almost entirely disappeared at a second.

In the discussion to follow I am satisfied evidence will be forth-

eoming of the uselessness of the operation of fixation of the uterus by any of the methods at present in vogue, exeept by means of the buried suture or vaginal fixation. I am satisfied that vaginal fixation of Dührssen is anatomieally ineorreet, carrying the uterus from one extreme to the other; that vaginal fixation is a great menaee to a woman who is about to be eonfined. Fixation by the buried suture should be accompanied by the removal of the tubes, and, as a consequenee, many a woman who would otherwise bear numerous children beeomes sterile as a eonsequence of our effort to relieve a few minor aches and pains.

Fowler suggests an operation that imitates the operation of Vuillet. He passes the urachus, a living strueture, through the uterus. The urachus is thus intended to form a new ligament forgotten by the Creator, something undone that should have been done. Fowler adopted four methods of proeedure, so that no one can say that his failures were due to a want of teehnique or beeause he left undone some trivial variation of the operation that he should have done.

1. He sutured the fundus to the anterior abdominal wall by means of some sutures with which the abdominal wound was elosed. This method is said by some to be very faulty.

2. He fixed by means of silk sutures the fundus to the parietal peritoneum in front and elosed the wound with other sutures. This is said to be the eorreet proeedure.

3. He sutured the anterior margin of the broad ligament, together with the fundus uteri, to the peritoneum of the anterior abdominal wall.

4. He removed one or both ovaries and Fallopian tubes and sutured the stumps anteriorly, and added this to the preeeding proeedure.

He states:[1] "At different periods of time, varying with the extent of the adhesions, these eases have shown more or less tendeney to relapse, and some, particularly those in the first group, have been complete failures almost from the very eommeneement." Having tried these different methods, he then, as he says himself, east about for some structure to afford a more stable support for the organ when restored to its normal position. For this purpose he seleeted the uraehus. Anyone who has studied the histologieal

[1] New York Medical Journal, October 5, 1895, p. 418.

structure of the urachus can scarcely expect to find it support much strain without relaxation. It is not a tendon. I admire Fowler's honesty as expressed in his report.

Mundé, in a paper read before the American Gynecological Society, touched what might be considered a keynote by asking and answering a question. He said that we might ask why such acute observers as Thomas and others had been misled to attribute the relief obtained in anteflexion to the use of pessaries. He might also have asked why eminent authorities in the present day had been misled to attribute the relief obtained in retroflexion to the use of pessaries and variations in position of the uterus. The answer to his question was that, in the light of our present knowledge, the symptoms were due to concomitant conditions, such as inflammations, enlargement of the uterus, etc., and that relief of these conditions was obtained by certain of the measures adopted.

All through the literature of the subject cases are recorded condemning the operation of Alexander of shortening the round ligaments. Many honest workers have stated definitely that they were disappointed with the results. Were they not endeavoring to cure some disease that did not exist? Were they not overlooking a condition beyond the mere flexion of the uterus?

And now comes the newer operation of ventrofixation. Many are dissatisfied with the results obtained. Are they not also overlooking the true condition present? To read the discussions on the subject a student must be bewildered. One writer, an eminent authority, states distinctly that it is not the flexion of the uterus that produces the trouble, but the prolapsus that stretches the vessels, and that, as a consequence, they become enlarged and engorged; that it is the amount of congestion or engorgement that causes the trouble, and not the backward displacement. Other authorities, equally eminent, consider that the flexion has all to do with the production of the symptoms; that the bloodvessels are thus bent, and the organ becomes, as a consequence, engorged and tender, and that by lifting the fundus forward all these conditions are altered. To look through the literature of the subject, however, one finds one set of operators who have nothing but praise for Alexander's operation, another set of operators who have nothing but condemnation. This is so in connection with ventrofixation. To ascertain the truth appears to be a difficult task.

Churchill, in his *Diseases of Women*, says "that the ancients were not ignorant of the occurrence of flexions of the uterus, though their views were very indefinite; their successors, however, lost sight of these conditions altogether until the labors of William Hunter and others threw a new and more accurate light upon this, to them, obscure accident." How much light they have thrown on the subject remains to be seen. In the history of medicine eras have apparently arisen in which flexions of the uterus were credited with the production of an immense amount of evil and in which they were almost entirely ignored.

For these maladies Simpson introduced the intrauterine stem pessary. The treatment was soon discarded. Unfavorable results were obtained, such as uterine pain, constant leucorrhea, menorrhagia, metrorrhagia, together with inflammation of the adnexa. As with all such procedures, however, so in this case, the institutor met with marvelous results. He saw none of the evils that befell other practitioners. After several years he republished an account of his experience, and in this he makes no mention of the failure of the mode of treatment, of the risks or of how they may best be avoided. At the present day the intrauterine stem pessary is something that is scarcely ever used. I have seen bad results follow its use, and will never, as long as I live, apply one again.

West says, on page 175 of his *Diseases of Females*, "that in the hands of those of that day even the cure of the displacement was not followed by the cessation of the symptoms." Women must have been in those days much as they are at present.

After Simpson and Valleix had cured their patients, Dubois examined many of them and found the uterus back in its old position. Seanzoni admitted that after he had discarded all mechanical supports for the uterus and contented himself with cold (in contradistinction to the present hot) vaginal injections, together with the antiphlogistic treatment of any chronic uterine inflammation and the application of caustic to the os uteri, and with the endeavor to remove the chlorotic symptoms which are seldom absent, he was much better satisfied with the results.

To my mind it is not so much the displacement itself, but the state of the uterus associated with the displacement, that requires treatment. If these slight mechanical displacements of the uterus cause such a long row of symptoms, fibroid tumors growing from the uterine wall should give rise to a similar set of symptoms. We

know, however, that fibroid tumors grow to a considerable size without giving rise to a single symptom that indicates their presence.

Retroflexion of the uterus is by no means always accompanied by constipations, and, again, many women with anteflexed uteri do suffer with constipation. Many women bear large families with the uterus retroflexed, and suffer no particular inconvenience from the retroflexion.

For the purpose of diagnosis it is very necessary that we should be able to distinguish uterine displacements. We should also be willing to admit that we know little or nothing regarding the amount of local suffering or functional disturbance that they produce. In many cases the presence of such displacements is a matter of entire indifference to the possessor, if not to the professor.

From my experience I cannot agree with some of the other writers. Madame Boivin states that flexions of the uterus are rare; she states that flexions in young unmarried women are rare. This is certainly not so; they are frequently met with.

In one breath we are advised to break up adhesions of the uterus to the peritoneum, to give relief to the symptoms supposed to be caused by them, and in the next breath we are advised to freshen the anterior surface of the uterus, produce adhesions, and thus relieve suffering.

It seems to me that we know about as much regarding the symptoms caused by flexions of the uterus as Gooch knew about the so-called irritable uterus. To read the description of Gooch's irritable uterus an abdominal surgeon of the present day must conclude that the cases were ones of salpingitis and pelvic peritonitis, and that the disease was not situated in the uterus at all. There are many good practitioners and close observers who are unable to satisfy themselves that flexions of the uterus *per se* require treatment. In the face of the storm-wave carrying with it Alexander's operation, vaginal and ventrofixation, they are timid about launching their frail barks in the sea of controversy. I have launched mine and expect to be engulfed.

NOTE.—The one exception referred to above[1] is complete descensus uteri [after perineorrhaphy has failed to support]; in such a case fixation of the fundus uteri by buried suture is indicated, with excision of a portion of each tube to prevent pregnancy.

[1] Page 408.

REPORT OF THREE CASES OF UTERINE FIBROIDS COMPLICATED BY PREGNANCY.

By M. ROSENWASSER, M.D.,
CLEVELAND.

Previous to the advent of abdominal surgery and of aseptic midwifery the management of pregnancy complicating fibroids was most unfortunate. Of two hundred and twenty-eight cases of labor complicated by fibroids collected by Gusserow,[1] more than one-half of the mothers and two-thirds of the children died. The assumption that many of these deaths may have been due to meddlesome interference on part of the obstetrician is contradicted by Süsserot's[2] carefully compiled tables. Among 147 such cases of labor collected by him, seventy-eight mothers died. Of the sixty-one mothers requiring manual or instrumental aid, thirty-three died. The remaining forty-five deaths were, therefore, among the eighty-six cases not interfered with. The labors allowed to go to a natural termination were undoubtedly those in which there was the least hindrance to delivery, and yet they ended as fatally as did those subjected to delay, injury, and sepsis.

In the more recent statistics collected by Stavely[3] there are five hundred and ninety-seven cases in which no interference occurred before labor. Of these two hundred and twenty, or 37 per cent, died. This reduction in the mortality is owing to improvement in technique within the last ten years. Among three hundred and seven cases reported as having aborted the death-rate was 12 per cent.[4]

It would seem, therefore, that surgical interference, either by myomectomy or by hysterectomy, is followed by more favorable results than are gathered from the statistics above quoted. The number of cases thus treated is, however, as yet insufficient to

[1] Cyclopedia of Obstetrics and Gynecology, vol. ix. p. 316.
[2] Ibid., p. 314.
[3] Johns Hopkins Bulletin, March, 1894, p. 33.
[4] Ibid.

enable us to formulate any fixed rules for general guidance. Each case must be considered on its own merits and must be managed in accordance with the best interests of the mother and, where possible, also of the child.

Wherever the location of the tumor is not likely to interfere with delivery, or its not too rapid growth will admit of delay until after the viability of the child, a conservative course is clearly indicated. Myomectomy in the interest of the child is justifiable in cases in which dystocia would become a strong probability. At or near term, in event of obstruction to delivery, suprapubic hysterectomy is probably the safest course.

The loss of mothers ought not to exceed 10 per cent. The children ought nearly all to be saved.

Dührssen's[1] proposition to deliver the child by vaginal Cesarean section, and then to preserve the uterus or remove it, as the nature of the case might indicate, has yet to be put to the test of experience.

If the fetus must be sacrificed the choice lies between abortion and hysterectomy. It is my belief that the dangers of the latter are less than those of the former; yet here is the point on which honest opinions will differ. To my mind the accidents attending hysterectomy are more controllable than are the complications of an abortion, in which the hemorrhage may become fatal from inability of the uterine muscle to contract, or the fibroids may slough and lead to sepsis. In some cases an abortion is impracticable because the cervix is beyond reach.

We have all seen subperitoneal fibroids of the uterus, especially smaller tumors, that have not only not been a hindrance to delivery, but have apparently disappeared after labor. Such can hardly be considered as complications. Of the three cases here reported, the first was a multinodular tumor consisting of large subperitoneal and interstitial nodes. The second was interstitial, extending from the lower uterine segment into the broad ligament. The last was also interstitial, occupying the entire lower uterine segment.

The first case was that of a woman, forty-one years old, who was seen by me in October, 1891. She had been married twelve years and had never been pregnant. She had enjoyed good health

[1] Der vaginale Kaiserschnitt, Berlin, pp. 27–33.

until about three years ago, when her menstruation became more profuse and of longer duration, sometimes continuing for two weeks. Two years ago she began to feel pain in the right inguinal region, and discovered a lump the size of a hand; this lump continued growing. Ten months ago she noticed a growth on the left side, with pain and gradual enlargement. The pain on the left became the most severe. The suffering had never been excessive. She had been able to be about and do her work until very recently. Her menstruation had ceased on May 1, 1891, and did not recur. The rapid growth of the tumor and the distress from fulness of the abdomen had finally caused her to seek relief.

The abdomen was enlarged to the size of an eight-months' pregnancy. Irregular nodular tumors could be seen through the abdominal wall, reaching to the right hypochondrium on one side and four inches above the umbilicus on the other. The tumor on the right side was round, smooth, hard, not fluctuating, not painful; several smaller lumps were attached by pedicles to the larger. The tumor on the left was round, soft, fluctuating. There were no movements, no contractions, no fetal or other sounds. The breasts were not enlarged, the areola not pigmented. The vaginal mucous membrane was bluish; the cervix short, velvety; the tumor projected all about the cervix, more especially on the left, and moved with it. The patient would not for a moment entertain the possibility of a pregnancy complicating her tumor, but thought she was undergoing the change of life. Her distress was such that she insisted on any operation that offered speedy relief. Diagnosis: double ovarian tumor with probable pregnancy, or fibroid with same.

Operation, October 17, 1891. Incision eight inches. Tumor multinodular fibroid of uterus containing a five and one-half months' fetus and placenta. Supravaginal amputation. Stump secured by *serre-neud*. No unusual difficulties, no shock. The tumor consisted of six large interstitial and two subperitoneal nodules, the latter attached to the uterus by broad pedicles. Weight of tumor, exclusive of amniotic fluid, twelve pounds. On the day following the operation the pulse was 78, temperature 99°. Urine passed freely. The next day a rapid development of septic symptoms. Death fifty-two hours after operation.

Autopsy. Pus in the line of incision, over the surface of the

Fig. 1.

Case 1.

intestines and omentum. Half a pint of pus in the pelvic cavity. On careful inquiry it was subsequently discovered that the towels in which the intestines had been enveloped while the tumor was being delivered had not been sterilized. The infection came from this source. The fatal result was due to avoidable accident, not to technique.

The after-thought, why should not an abortion have been preferable in this case? must be met by the fact that the character of the tumor was not positively made out, and that in case of a pregnancy complicated by ovarian cystoma it was possible to save the child after ovariotomy. Should the tumor prove to be a multinodular fibroid, hysterectomy was deemed more safe than abortion. My disappointment over the deplorable outcome, for personal reasons as well as for the sake of the record, is as keen today as at the time of its occurrence.

I first saw the second case, in consultation with Dr. Peskind, in October, 1893, when she was four months pregnant. She was about thirty-four years of age, had been married twenty years, and had had three children. For two years previous to the present pregnancy she had suffered from profuse menstruation lasting five or six days, attended by painful labor-like pains. The tumor was hard, occupied the smaller half of the pelvis and the right iliac fossa, being drawn up by the pregnant uterus, which occupied the left pelvis and corresponded in size to a four-months' pregnancy. It did not seem likely that the tumor would obstruct delivery. Advised non-interference. She was delivered at term, without difficulty, of a healthy child. On examination three months after confinement the tumor could not be found. It seemed to have been involuted with the uterus.

Nine months after childbirth, December 10, 1894, the patient came to the hospital complaining that for three months she had been having profuse hemorrhages at intervals of two or three weeks, lasting six days, with constant pain in the back, loss of appetite, insomnia. She was quite anemic, emaciated, with a pulse of 112. The tumor had again developed so as to reach an inch above the pubes, and extended out into the base of the right broad ligament. After ten days' use of strychnine and rest the pulse came down to 90, but her appetite and pain remained as before. Hysterectomy advised and accepted.

Operation, December 20, 1894. Trendelenburg position. Incision from umbilicus to symphysis. No complications. Total hysterectomy. Silk ligatures. Stumps turned into broad ligament. Latter closed, shutting off peritoneal cavity completely. Abdominal incision closed. No flushing, no drainage, no shock, no vomiting. Excepting small stitch abscess, her recovery was uneventful. Subsequent symptoms of menopause, and slow recovery from extreme anemia.

The third case, a school-teacher, was kindly referred to me by Drs. Folkens and Parker. She was thirty-seven years old and had been married twelve years, having had two miscarriages soon after marriage. She had a very healthy appearance, inclined to be stout. Her first knowledge of a tumor was gained after difficult micturition three and a half years ago. For the removal of the tumor a section had been performed in May, 1894. The tumor, a fibroid of the uterus, was said to have been anchored fast by numerous and dense adhesions to intestines. No attempt was made to remove it. The right ovary was removed. The left could not be found on account of universal adhesions. Recovery was delayed by a mural abscess. The tumor had not increased since the operation until after cessation of the menses four months ago. Now it is rapidly growing larger. There is evening vomiting. Attempts have been recently made to bring on an abortion, but have failed. The cervix is small, pressed tightly against and behind the symphysis. A round, resilient tumor fills the pelvis and rises into the abdomen as far as the umbilicus; most resistant in the posterior cul-de-sac; not nodular, but smoothly rounded. Arterial bruit audible. No movement, no fetal heart-sounds. Patient insists on the radical operation; she is unwilling to take any other chances.

Operation, December 23, 1895. Trendelenburg position. Incision three inches beyond the umbilicus, partly through the old cicatrix. Uterus rounded, non-adherent. Delivered through the incision, and the upper end of the incision closed. Pregnancy in the upper part of the uterus, tumor in the lower. The right appendage is missing. The right upper broad ligament constitutes one huge vein, which is doubly ligated and cut. Considerable recurrent hemorrhage from the dissected bladder flap. A few intestinal adhesions are found low down. Release and close weak points of gut-wall. The uterus was amputated according to Baer's method.

Fig. 2.

Case 3.

The peritoneal cavity was completely shut off. No flush or drain. A weak spot in the old cicatrix (ventral hernia) was excised and the abdominal incision closed. No shock. Recovery uneventful. On opening the anterior wall of the specimen a four-months' fetus was found intact in its membranes. The placenta was attached within the left half of the uterus. The tumor occupied the lower segment of the uterus and cervix. It was somewhat edematous, with small spiculæ of lime salts between the capsule and tumor proper.

The location of the tumor and the inaccessibility of the cervix precluded any attempt at abortion with reasonable hope of success. My advice to the patient was to postpone her operation until after viability of the child, which seemed to me to be eminently proper. She, however, was firmly opposed to further delay and the slightly additional risk. She left me the alternative of operating early myself or of abandoning the case to somebody else to do it. Believing, as I do, that a woman has the right to decide for herself in a matter involving danger to life, I consented to do the operation.

ALBUMINURIA IN PREGNANT AND PUERPERAL WOMEN.

By ABRAHAM FREDRIK EKLUND, M.D.,
STOCKHOLM.

It seems as if the human race, especially its feminine portion, had scarcely escaped one terrible scourge before another, still worse and more widely spreading, threatens to thin its ranks. The devastating plagues of past ages—the plague in Athens in the fifth century B.C., the pest of Antoninus in the second century A.D., the great plague in the time of Gallas in the third century, the sixth century plague (inguinal plague), the great gangrene plague of the middle ages, the puerperal plague of the fourteenth century, the sweat plague of the fifteenth century, etc.—belong now to diseases of the past, having been successfully stamped out by energetic and appropriate sanitary means, especially ventilation and isolation. It is also due to rigid anti- and aseptic measures that we have succeeded in practically exterminating that formidable scourge, puerperal fever, which has reaped so many victims, showing what modern sanitary and hygienic means have accomplished in our maternities of today. But in its place a new evil, much more insidious and treacherous, is gaining a foothold and spreading more and more widely, at least in my beloved country and more especially in my private field of work—namely, the albuminurias.

For the maintenance of health it is absolutely necessary that all the organs of the body should perform their functions and that equilibrium and harmony between the various functions of the different organs should be constantly maintained. Any deviation from this may be followed by dire results. "If a limb suffers the whole body suffers." In the question now before us the functions of three different organs especially interest us—namely, the skin, the kidneys, and the digestive apparatus. There is, as is well

known, a constant interchange of relations going on between the skin and the kidneys, whose function it is to eliminate from the system a number of agents as yet imperfectly known, but in their action, even in infinitesimal quantities, highly poisonous. The three organs now in question often become in the pregnant woman the seat of more or less serious disturbances.

One of the most commonly occurring of these functional disturbances has its seat in the sweat glands, showing itself in diminished sweat secretion as a result of repeated and long-continued cooling of the skin from insufficient clothing in a cold climate.

Even in our country there is at present a contention going on between the advocates of woolen and those of cotton underwear, the latter exerting themselves to the utmost to influence the public against the use of woolen underwear, giving as their reason—which, however, is as yet altogether unproven—that wool irritates the skin while cotton is indifferent. It would seem that those who regard the use of woolen underwear so unfavorably ought to present some facts or some experimental proofs in defence of their statements, but such has not been the case.

From my long experience in the practice of medicine I can safely say that the ordinary cotton underwear is altogether insufficient for women in our cold climate, and especially for pregnant women. Cotton, from its tubular structure, absorbs and gives off the sweat again with equal ease, and hence it is that after physical exertion the skin clad with ordinary cotton becomes cool, there is a diminished blood-supply to the skin, and a number of the sweat glands cease functionating, wherefore the kidneys (their glomeruli especially) are called upon to take the *rôle* of the skin, with the result that these are overstrained and irritated by poisonous materials, so that their filtra become pervious to serum-albumin, which latter appears in the urine. The later developments in these cases will depend on circumstances. The disturbance in function may be only temporary and is easily amenable to treatment at first; but should it be long continued the kidneys may suffer irreparable injury, and even contracted kidney may finally result.

The experience of thousands has proved conclusively the fact already demonstrated, that if woolen worn next the skin has any irritant action this must be an adequate stimulus in our cold climate,

where the cold constantly tends to weaken and paralyze the function of the sweat glands, which is in no way maintained by the cotton underwear, even though this latter may have a certain stimulating action on the skin, similar to the thin-meshed shirts of tied cotton yarn.

It is not long since[1] we were surprised to learn that all of a certain number (one hundred and six) of women, primi- and multiparæ alike, had albuminuria in the early puerperium (in 26.2 per cent. of the cases at least 0.05 per cent. albumin, in increasing quantity up to 1.2 per cent. in *one* case), and that each of these women immediately after parturition had albumin in the urine; furthermore, that almost every case of albuminuria in puerperal women is dependent on a renal affection, even if slight, and not, or at least not wholly, on a urogenital catarrh, as even urine containing only nucleo-albumin (60 per cent.—*i. e.*, eighteen cases out of thirty) can be the product of a diseased kidney; and, finally, that the cause of this albuminuria is an excessive functional activity on the part of the kidneys, there being increased resorption of fatty detritus as a result of the process of involution going on during gestation and until the end of the puerperium, more especially in the uterus, where during parturition itself the violent contractions of the muscles act like a forcible massage, kneading out, so to speak, from the tissues the products thence to be eliminated through the secretions of the body.

According to the recent investigations of K. A. H. Mörner[2] it has been found that albumin is a constant and therefore *normal constituent* in the urine of both men and women.

Although not wishing to go beyond the limits of my subject, I cannot refrain from pointing out how dangerous and pernicious it would be, therapeutically and hygienically, to apply this rule in the case of those afflicted with albuminuria. To prove the correctness of my statement I will relate a case from my private practice: Anna Sofia O., aged thirty-seven years, single, has always had good health; has at times, however, taken Blaud's pills. During the summer of 1895 she was induced to wear cotton next the skin, instead of woolen as heretofore, and continued with this during

[1] Upsala läkareföreningsförhandlingar, xxx., 1, pp. 41-73. Lincoln Paykull, Om albuminuri hos myförlösta qvinnor, pp. 55, 60, 64, 65, 66.

[2] Hygiea, lviii., pp 1-68.

the cold season in order to harden herself. She soon complained of a feeling of cold in the region of the kidneys, and later an icy coldness in the whole body; the arms and legs were benumbed; she had a feeling of heaviness in the head, and was so weak that she was unable to be up. My examinations revealed only a slight albuminuria, nothing else. She was now kept in bed, the whole body enveloped in flannel, the sweat glands were kept moderately active and the bowels evacuated daily; milk diet and a solution of sodium acetate (100 to 600 aqua), one tablespoonful q. 2 h., were prescribed. After the albumin had disappeared from the urine and there were no longer any subjective symptoms, I allowed the patient to get up. She has since worn flannel and has been well. I am of the opinion that it was the patient's good fortune that I was old-fashioned enough to consider her albuminuria a result of her prolonged exposure to cold and to treat her accordingly. In accordance with the latest ideas on the significance of albuminuria the patient would have been declared well, as "albumin in the urine means nothing." She would have continued to violate the simplest law of hygiene—keep the body warm—and the functional disturbance of the kidneys would sooner or later have led to incurable organic disease.

To return now to my subject, after this little digression: Albuminuria in pregnant women is indeed a symptom not to be lightly considered. If, from a very large number of observations of these cases, I should construct a clinical picture of the disease, I find that the most prominent symptom is a certain drowsiness and feeling of fatigue. One can easily appreciate the significance of this, as the greater part of these women belong to the laboring classes; they are either wholly unable to work or perform their duties with great difficulty, whether it be in the capacity of housewife or singly in the struggle for existence, which brings with it also a social evil.

Another important symptom is the feeling of icy coldness in the whole body, always affecting those afflicted with albuminuria to a greater or less degree, beginning in the lumbo-sacral region and spreading over the whole body. There are no chills, properly speaking, that come and go at certain intervals, but a continual cold feeling day and night. There is a feeling of weight in the head, dizziness, diminished sense of sight and hearing, disgust for

food, nausea, formication in arms and legs, constipation, dry cold skin, lessened urinary secretion, weak heart-action, dyspnea, and feeling of oppression. To these symptoms of autointoxication there is added later, when a real nephritis, either catarrhal, parenchymatous, or interstitial, has more or less gradually developed, swelling of the legs and abdomen, and very suddenly eclamptic convulsions supervene, which are of late becoming more and more frequent in pregnant women.

From what has been said it is evident that the albuminurias of the puerperium are, many of them, only a continuation and exaggeration of the already existing functional or organic disturbance of the gravid state, while others date from the act of parturition itself, caused by excessive functional activity of the kidneys.

That the steadily increasing intra-abdominal pressure is not a hindrance to the cure of albuminuria during the progress of pregnancy, provided the proper treatment be instituted, is shown by the following case:

A married woman, aged thirty-seven years, pregnant for the third time, consulted me because she felt so tired that she was unable to be up and about. On examining her I found her to be seven months pregnant, very drowsy and weak, with a considerable amount of albumin in the urine. She was well covered up with quilts and blankets, the body enveloped in flannel, and diuretics and laxatives prescribed. Although the abdominal walls were distended more and more during the normal progress of the pregnancy, the albumin disappeared completely after the exhibition of sodium acetate (100:600 grammes) and a diet consisting chiefly of milk and beef-tea with parsley. She was able to resume her duties in the household.

In conducting a normal delivery and the puerperium the old obstetricians were in one respect notably our superiors; in another equally important question we still adhere to the traditions of our forefathers to our own disadvantage. We have, therefore, on the one hand, something to learn from them, and, on the other, a prejudice to overcome, substituting something better in its place. I well remember with what anxious care the parturient woman used to be guarded from the least exposure to cold in times gone by, and how with equal solicitude she was kept gently and continually perspiring throughout the puerperal period—a mode of pro-

cedure which showed the most beneficial results for the woman. It was their powers of observation which enabled them to see that the profuse sweating had a most beneficial influence, favoring the secretion of milk and relieving the kidneys from excessive activity—promoting the division of labor and maintaining equilibrium between the functions of these two analogous organs.

But if we do well in following the example of the old obstetricians in this respect, we must, on the other hand, in every way strive to discourage and overcome a prejudice that has been handed down to us—namely, the prejudice against the use of laxatives just previous to and during parturition as well as the three or four first days of the puerperal period, it being formerly supposed that this would tend to lessen the milk secretion. It is a procedure the exact opposite of this which has shown the best results, both in parturition and in the puerperium. It would, therefore, be desirable that the pregnant woman should be instructed by the midwife whom she has engaged for her confinement as to the necessity of daily evacuations from the bowels throughout the pregnant state; and especially toward its close and the beginning of labor she should use laxatives and enemata, if necessary, and this should be repeated every day throughout the puerperium. Personally I have followed this rule for a long term of years, and I have been most successful in my humble efforts to save the kidneys from overactivity and prevent intoxication by keeping the bowels soluble and gently stimulating the sweat glands to functional activity.

In the maternities three hygienic improvements would be necessary in order to realize the above-named conditions. In the first place, the rooms occupied by the parturient and puerperal women ought to be heated to a uniform temperature of 18° C. or a little higher—not 10° or 12° C., as is often the case in our cold climate. Secondly, at least double the number of blankets would be necessary, as a single, often old and worn blanket is quite insufficient for maintaining a constant perspiration, one extra over-blanket, and preferably also an under-blanket, being necessary for this purpose. Thirdly, it would be well-placed charity if private contributions were more liberal than heretofore for these "unfortunate ones," in the shape of donations of flannel underwear, shirts, drawers, and stockings, in double sets, to take home with them on being discharged from the hospital.

The importance of administering diuretics and mild aperients to the puerperal woman as long as albumin continues in the urine should be impressed. The following can be used:

Cort. frangulæ, Fol. sennæ,	. . . . .	āā 20 gm.
Flor. sambuci, Flor. tiliæ, Fruct. juniperi,	. . . . .	āā 30 gm. M.

Sig.—From one teaspoonful to a tablespoonful in a large cup of boiling water, as tea two or three times daily.

Philanthropy has founded asylums and maternities, and Christian charity donates means that they may answer the purposes for which they were intended. But it is also absolutely necessary that they should be provided with physicians, that they may be well warmed, that the food be suitable for the anemic, albuminuric convalescents, that there be opportunity for hot baths and abundance of warm bed-clothes.

Finally, it is with sincere respect and gratitude that I acknowledge that I have had the opportunity to observe cases of albuminuria that persisted after the puerperium, treated by able colleagues, and have been able to verify a complete *restitutio ad integrum*, not to mention all the cases where nature cured the disease without any artificial help.

Conclusions. 1. In handbooks for midwives attention should be called to the necessity of examining the urine of every pregnant woman. In case the urine is found to contain albumin, the midwife should be competent to order hot tub-baths, flannel underwear, rest in the recumbent posture, mild diuretics and laxatives, beef-tea with parsley, seltzer water with boiling milk food, boiled fruit, weak coffee, tea, and chocolate, compound licorice powder, etc. If this hygienic treatment does not within a certain time, say a month, cause the disappearance of the albumin, a physician should be called.

2. A matter of great importance is that the pregnant woman should learn to procure for herself daily evacuation of the bowels, especially toward the end of pregnancy and in beginning labor. For this purpose dietetic means should be employed chiefly, but in case of failure mild aperients should be used, such as cascara,

senna, frangula, compound licorice powder, and enemata of water and salt.

3. Of the very highest importance during pregnancy, and especially during the puerperal state, is the care of the kidneys, the avoidance of all that would tend to increase the functional activity of these organs, the maintenance of equilibrium and the proper division of labor between the skin, digestive apparatus, and kidneys. If any organ can bear a greater exercise of function, it is the skin, and next in order of tolerance the intestinal tract; the lungs are far more sensitive, but the kidneys most of all.

4. No puerperal woman should be permitted to leave her bed until her urine is free from albumin, if possible.

THE RELATION OF MALIGNANT DISEASE OF THE ADNEXA TO THE PRIMARY INVASION OF THE UTERUS.

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It has come more and more from clinical observation and experience to be believed that the appearance of malignant disease of the tubes is the direct result of the extension of the morbid processes from the corporeal endometrium of the uterus. The invasion of the oviducts through the lymphatics may take place, but such an attack is for the most part a rare event. The extension of cancerous disease from the ovary to the tube is also of comparatively infrequent occurrence. The development of primary epithelioma of the mucosa of the tube may take place, but when it does occur it is more likely to be secondary to papillary adenoma of the tube itself. Carcinoma that takes place in the ovary presents two forms: (1) the primary development of ovarian carcinomatous foci; (2) carcinomatous degeneration of ovarian cystomata. The latter may occur in the form of papillary degeneration or with the appearance of a carcinomatous transformation of the glandular tissue surrounding or involving a cystoma. In connection with cancerous invasion of the ovary, the mesenteric, omental, or other tissues may become affected, so also may the glandular structures in the retroperitoneal spaces undergo serious involvement.

While it has often been conceded that the stromal element of the ovarium furnishes a suitable nidus for the growth of malignant rudiments, the question very properly arises whether such a development occurs for the most part from original embryonic implantation of cells or from secondary changes through infiltration of the surrounding structures. A case of a papillomatous neoplasm that recently occurred in my practice presented indications that the invasion was originally uterine in character; at a later period

the symptoms showed that the disease had reached the tubal and ovarian structures, which afterward underwent more rapidly cancerous degenerative changes than did the tissues of the uterus. The histological appearances of epithelioma occurring in the tube, and bearing such a striking resemblance to the manifestation of the changes that are developed by cancer in the corporeal endometrium, force one almost to the conclusion that the morbid processes thus engendered are secondary to those resulting from the uterine invasion. The rareness with which sarcoma is met with in the tube is significant. Though this neoplasm in the uterus is not so frequently observed as cancer, it is not uncommonly found in the uterine endometrium. The lower segment of the uterus, as well as the stroma of that organ, does not furnish a nidus particularly congenial for its habitat; placental fragments and hyperplastic villosities are too remote for affording a starting-point for its development. The same may be said, in most instances, of the structures of the adnexa. It is only when sarcoma has gained admission into the uterine tissue that the progress of its extension, either by papillary proliferation or by the fragmentation of its elements toward the structures of the tube and ovary beyond, will be likely to take place. The cases which have occurred in my own practice, as well as those that have been observed by others, would seem to justify the conclusions here reached.

Sarcoma may occur in the pelvic cellular tissue; so also it may originate in the mesentery and in the tissue posterior to the uterus, and involve the ovary, as it did in a case of one of my own patients; these cases occurring, however, so infrequently, their discussion in this connection can hardly be deemed worthy of introduction. Those cases sometimes denominated fibro-sarcoma, myxo-sarcoma, and adeno-sarcoma of the ovary do not primarily present any purely sarcomatous element; they exhibit such characteristics only after having assumed a malignant or a degenerative change. Sarcoma of the ovary may either be of the spindle-celled or of the round-celled variety. The former has its origin in the stroma of the connective tissue. In this respect its histologic features are not unlike the embryonic and rudimental developments appearing in the structures of the corporeal portions of the uterus, where the growth is more generally observed. The rapidity with which the formation of the neoplasm takes place, the tendency

toward the supervention of ascites and peritoneal involvement, demand early removal of the disease. A review of the records of my cases shows that the morbid processes had pre-existed in the uterus. In one case in particular it was easy to observe that soon after the invasion of the spindle-celled elements had reached the ovarian stroma, symptoms of irritation of the pelvic tissue became marked and the cachexia of a malignant growth appeared. The autopsy showed that the sarcomatous elements were comparatively innocuous while they were confined to the stroma of the corporeal portion of the uterus.

As before remarked, sarcoma may appear as the spindle-celled or as the round-celled variety. The spindle-celled is more commonly found in the parenchyma of the organ; the round-celled variety forms what is known as the diffuse sarcomatous growths of the connective tissue of the uterine mucosa. These soft, papillary neoplasms are liable to implicate the entire uterine mucous surface, and even to extend into or toward the parietes of the organ and to involve the peritoneal and the intestinal structures. This form of a sarcoma rarely advances toward the ovary. The round-celled sarcoma belongs to the class that may reach or develop in the connective tissue of the ovarian stroma. This texture of the ovary seems to offer at times a peculiar pabulum for its development. In some instances the tumor of the ovary assumes a rapid increase in its dimensions. In such cases the sarcomatous elements will be found deeply imbedded or disseminated in the parenchymal portion of the uterus. In one of the two cases of sarcoma of the ovary of this class that came under my care, the presence of the spindle-celled element in the deeper structures of the uterus was very distinct. In the record of a case of an autopsy which I assisted the medical examiner, the late Dr. A. F. Holt, in making, I find that there were spindle-celled growths in both ovaries and that nodular masses of sarcomatous tissue were deeply infiltrating the uterine structures. I regret that in the record of this case I did not preserve a more detailed history of the occurrence of the symptoms. Suffice it to say that the patient had suffered to a considerable extent before the rapidly fatal pathognomonic signs supervened.

As before remarked cancer of the ovary is in large measure secondary to cancer of the uterus. The ovarian cancer that has been

thought to be primary has appeared either as a diffuse infiltration of the stroma of the ovarium, advancing or penetrating into the follicular epithelium of Pflüger's tubules, or as a papillary proliferation of the periphery of the organ. The former variety somewhat resembles sarcoma in its characteristic features by the burying of its club-shaped roots deep into the stromal texture of the ovary. These morbid processes lead to the destruction of the organ by its splitting apart, that causes to ensue an undue pressure upon its normal elements. Scirrhus is another form of cancer which may take place in the ovary. Both cancer and sarcoma of the ovary should be regarded as secondary formations. The epithelial form of cancer having its starting-point in the mucosa of the cervix or of the lower segment of the uterus, and sarcoma for the most part beginning in the deep connective tissue of the fundal portion of the uterus, are disease processes that may take on a progressive stage and be productive of an involvement of one or both ovaries. This view here taken is not dissimilar to the conclusion once reached by Emmet, who said that "when the ovaries (in such cases) are implicated it is, as it were, the last stage of some contiguous disease in which the rest of the pelvic tissue will have already been involved." When carcinoma originates in the glandular element of the uterine mucous tissue, it may rapidly give rise to polypoid degeneration of the endometrium and to metastatic nodules and centres of infection in the appendages. Carcinoma developing upon uterine adenomatous growths may extend to the ovaries as well as to the tubes, as before mentioned. An early recognition of the relationship of these progressive morbid processes should have a wider significance than what may be appreciated merely by the microscopist or pathologist. In these days, when experience shows with what safety many morbid growths can be removed by vaginal or abdominal section, our attention should be directed toward every point in the field of operative measures that offers a vantage-ground. The record of cases thus far made shows that the removal of malignant tumors by salpingo-oöphorectomy is far from being satisfactory. The recrudescence of the growths is almost certain to follow. Nothing short of a resort to total hysterectomy for removal of malignant affections of the adnexa will give promise of obtaining successful results. This method of proceeding is especially indicated when the cancerous disease has

appeared in the epithelium of the follieles eonnected with Pflüger's duets. In sueh eases, though it may be quite diffieult to make a differential diagnosis, still the surgeon ean feel tolerably sure that in the absenee of peritoneal involvement or of omental invasion, of reetal eomplication or of post-uterine affeetion, the malignant proeess has had its origin in some portion of the uterine tissue; when these untoward faetors do not exist, if the development appearing in the uterine appendages is sareomatous, the indieations will point to the eentral or the fundal portion of the uterus as being the original seat of the disease.

Another consideration of much praetieal importanee should not be lost sight of, as may be better appreeiated in those eases of malignant disease in whieh vaginal hystereetomy is sometimes resorted to. In many of those eases the adnexa may not, in whole or in part, be removed, on aeeount of adhesions formed or peeuliar relations existing in those organs. When the appendages thus left have been also the foei of malignant invasion the disease will take on almost immediately a renewed aetivity, as oeeurred January last in a ease that eame under my observation. In sueh desperate eases abdominal hystereetomy, ineluding the adnexa, will be found to offer the surgieal measure most likely to be attended with sueeess. Assuming as we may, that eaneer appearing in the ovary is sometimes a primary development, total hystereetomy, when the ease ean be seen at an early date, presents the best ehanees for sueeess. If the infiltration of the base of the growth extends into the deep pelvie eellular tissue or into the broad ligament, operative proeedure, of eourse, ean seareely be of mueh avail. Most of the eases of ovarian eareinoma, however, that have been held to have had their primary seat in that organ would seem to have been so regarded on aeeount of the respeet that may have been neeessary to be paid to the dietum of the older authors. It eannot be too strongly emphasized that a laeerated eervix, the result of parturient proeesses, furnishes a surfaee favorable to the development of malignant neoplasms; this eondition of the eervix is espeeially adapted to the growth of epithelioma or papillomatous formation. Fibromyomata appearing in the eorporeal portion of the uterus are liable to take on degenerative ehanges and beeome the eentre for malignant infeetion, whieh may penetrate the struetures immediately surrounding or be extended to the appendages above.

THE DIFFERENTIAL DIAGNOSIS OF SHOCK, HEMORRHAGE, AND SEPSIS.

By EUGENE BOISE, M.D.,
GRAND RAPIDS.

It may be that there is no necessity for taking the time of the Association in the consideration of conditions so well understood, but lives have been lost because of the difficulty in making a correct differentiation between these conditions, and if, by the discussion which this paper may be the means of introducing, any additional point of value may be brought out, I shall feel that I have not taken your time in vain.

There does not seem to be a universal clearness, if I may so express myself, as to what shock is, many thinking that the term shock, as used in abdominal surgery, implies, directly or indirectly, hemorrhage. But while shock may be complicated by hemorrhage the two conditions are in reality absolutely distinct. Shock in no sense means hemorrhage, nor does hemorrhage imply shock. Shock is a profound irritation of the entire sympathetic nervous system whereby certain symptoms are produced, the final or collective manifestation of which is profound mental and physical depression. In its pathology there is no question of hemorrhage. It is primarily and absolutely a nervous condition: hyperirritation of the sympathetic system, with secondary depression of the cerebro-spinal.

Hemorrhage may produce symptoms similar to those of shock with cerebro-spinal depression, but this condition should properly be termed syncope or collapse. Hemorrhage may be, and often is, complicated by a certain amount of shock as shock, may be accompanied by hemorrhage. But it is our province today to consider these conditions uncomplicated.

I have said that they may give rise to very similar symptoms, so similar as to be often confusing to the best diagnosticians. Such symptoms are briefly: pulse small, often almost imperceptible

tible, very rapid and of very low tension; breathing slow, sometimes sighing; temperature low, frequently subnormal; urine scanty. These conditions may exist in equal severity in both shock and rapid secondary hemorrhage. But their production is from very diverse causes, and for their successful treatment these causes should be differentiated.

How then can we recognize them, how distinguish between shock and rapid secondary hemorrhage? I speak thus of *rapid* hemorrhage, as this is the only form that can be confounded with shock. Also because there is another form of secondary hemorrhage whose symptoms more resemble sepsis than shock; that is, slow hemorrhage from a small artery, the loss of blood being so gradual that the system can, to a certain extent, accommodate itself to it.

Between shock and ordinary secondary hemorrhage there are various points of distinct difference; but our main reliance for diagnosis must be the pulse, all other symptoms are simply corroborative.

In shock the pulse assumes the characteristic nature before the patient leaves the table. It may become more rapid and smaller after the effects of the anesthetic have passed away; but this is not the rule unless the condition is aggravated by improper treatment. In shock, then, the pulse becomes at once very rapid and very feeble. In hemorrhage this condition is *always* gradual in its approach, and is never perceptible till some time after the close of the operation. The pulse of shock tends to improvement if not aggravated by improper treatment. The pulse of hemorrhage invariably grows gradually worse.

We may make then the pulse our keynote in the differentiation of shock and hemorrhage. But to do this properly and successfully it is necessary, above all things, that the operator shall study the pulse himself, placing no reliance on the chart. This implies that he shall study carefully, in every case of abdominal section, his patient's pulse before the administration of the anesthetic, and again when the patient is thoroughly anesthetized. He shall familiarize himself with its resistance, its frequency and its general characteristics.

When the operation is completed, before the patient is removed from the table, he shall again carefully study it with special refer-

ence to its resistance, size, and frequency. He is then prepared to note any change in these respects that may occur from hour to hour.

If a previously good pulse is very small, very rapid, and very compressible immediately after an operation in which the loss of blood has not been great, the condition is one of shock. This condition may continue unchanged several hours, unless relieved by proper treatment.

If, on the other hand, the pulse is comparatively good at the time the operation is completed, and soon after the patient is "put to bed" begins to grow gradually more feeble, more rapid, and smaller, we have, without any doubt, hemorrhage. Perhaps I should not say "without any doubt," because cases which have been denominated "reflex shock" have been reported[1] where the characteristic symptoms of shock first manifested themselves one or two hours after the operation, after recovery from the anesthetic, the pulse having been of good character up to that time. These cases must be rare and due to cerebral impressions, or to some irritation of the cerebro-spinal system, which is not manifest while this system is deadened by the anesthetic, but which becomes active as the anesthetic passes away. It is properly called reflex shock because the irritation must be conveyed to the sympathetic system before it can be manifested as shock.

These cases, I have said, are comparatively rare, and fortunately, as in cases where no drainage is used, it will be extremely difficult to differentiate them from hemorrhage. The color and the nervous or mental condition would be our only reliance as far as the symptomatology of the two conditions is concerned. But fortunately the hypodermic administration of a large dose of codeine will aid greatly in our diagnosis. It will do no harm in hemorrhage, and will rapidly dissipate the symptoms of shock by obtunding the cerebro-spinal irritation which is the source of the sympathetic disturbance.

There are, however, other symptoms that we may study as corroborative of the pulse, the first and principal of which is the patient's color. Invariably in shock there is a livid character to the pallor, which is distinctive and does not occur in hemorrhage.

[1] Ruhl.

This is especially noticeable under the finger-nails and in the mucous membranes. However anemic a patient may be before operation, if she suffers profoundly from shock, so profoundly as to make the question of diagnosis of especial importance, there will be a blue, livid character to the bloodlessness of the nails and mucous membranes, because, though the arterioles are empty, the capillaries and veins are comparatively full. On the other hand, if the pallor is caused by hemorrhage, it is more decided. The nails and mucous membranes are actually bloodless; there is no venous stasis to impart the livid character to the tissues that we see in shock. The mucous membrane and all soft tissues are actually bloodless. Again, there is one other symptom on which a certain amount of reliance can be placed when it is considered with relation to the two conditions just mentioned, and that is the mental attitude of the patient.

In shock there is very generally a condition of mental apathy, sluggishness of the intellectual faculties, with coincident physical depression. On the other hand, secondary hemorrhage generally induces early an apprehensive, excitable mental condition with restlessness, which is sometimes very marked.

This variation is the direct result of the diverse vascular conditions of the brain. In shock there is acute arterial cerebral anemia, with passive venous congestion. In hemorrhage there is absolute anemia, both arterial and venous.

Upon these three symptoms must our main reliance be placed in differentiating between shock and hemorrhage.

Between shock and sepsis the diagnosis should not be difficult theoretically, inasmuch as shock is a condition immediately consequent to the operation, while sepsis occurs gradually after the lapse of hours if not days. Again, in the early stages of sepsis the temperature is invariably elevated, while in shock it is depressed.

Where the patient was in a septic condition at the time of operation, with a rapid, small pulse, there might possibly be a question as to the existence of shock, but if the operator had rendered himself familiar with the pulse and general condition of the patient before operation, the post-operative diagnosis would be freed from most of its difficulties.

It might be thought that the same would hold true as to the diagnosis between hemorrhage and sepsis, namely, that hemorrhage

occurs immediately after operation, while sepsis is a later condition.

That is, of course, the rule, but there are conditions which render the diagnosis extremely difficult. These conditions may be said to depend partly upon the volume or rapidity of the hemorrhage and the time of its occurrence, as also upon the early or late appearance of the manifestations of sepsis. That is, there may be free absorption of septic material before the operation is fairly completed, as where extensive raw surfaces, caused by the separation of adhesions, are flooded with a virulent fluid which is not at once removed. In such case there will be almost immediately after the completion of the operation a decided and continuous increase in the rapidity of the pulse.

A similar condition would occur as a result of secondary hemorrhage, but the increasingly rapid pulse would be the only symptom in common. The pulse of hemorrhage would become rapidly smaller and more compressible, while in sepsis it would grow more rapid but harder. The color in hemorrhage would rapidly be lost, while in sepsis there would be little change. The temperature in hemorrhage, such as we are considering, would be normal or possibly subnormal, while in this rapidly occurring sepsis it would be invariably elevated, corresponding, to a certain extent, to the pulse. I think I may state it as a fact that the temperature in sepsis following abdominal section never becomes subnormal or normal till peritonitis supervenes, and in such form or degree as to involve the sympathetic ganglia in the irritativ e process, or until death is imminent. Under such conditions you would get a very rapid small pulse, with abnormally low temperature.

This condition never occurs, however, within the first twelve or even twenty-four hours following the operation. And this fact alone differentiates it from that form of hemorrhage that causes subnormal temperature.

A rapidly increasing pulse, with normal or subnormal temperature occurring immediately after operation, means hemorrhage, except in those rare cases of reflex shock mentioned above.

But there is another form of hemorrhage occurring after abdominal section which is distinguished from sepsis with much greater difficulty. It is when the hemorrhage begins several hours after the completion of the operation, and is very gradual but continuous, the blood being poured out into the free peritoneal cavity. In

sueh eases the pulse, while remaining unehanged for several hours after the operation, gradually grows more rapid and feeble, and at the same time the temperature rises, though not to a point corresponding to the pulse. Sueh cases have been reported by Buekmaster, Fry, and others.

In the session of the Société de Chirurgie in Paris, December 4, 1895, there was a discussion of this very eondition, eonsequent on a case by Peyrot.[1] In sueh eases the question as to hemorrhage or sepsis becomes very pertinent.

Hemorrhage causes a pulse whieh, while it gradually grows more rapid, at the same time becomes softer and smaller. The pulse of sepsis, though equally rapid, would maintain or inerease its tension. The color in hemorrhage would gradually be lost in spite of the aeeompanying fever. In sepsis it would be unehanged, or there would be an inerease of eolor due to the fever. The abdomen in hemorrhage would be flat, soft and free from inereased tenderness, or somewhat distended and "boggy." In sepsis we should expeet some tympanites and a eertain amount of hardness of the museles.

In hemorrhage the mental eondition is either unehanged or becomes somewhat anxious or apprehensive. In sepsis there is more apt to be a eondition of exeitation.

In hemorrhage there is a greater disproportion between the temperature and the pulse than in sepsis.

But partly beeause of the eomparative rarity of this form of hemorrhage, and partly beeause the symptoms of the two eonditions are so similar, the differential diagnosis will always be a matter of great difficulty to most of us.

The one important eonelusion that I will draw from the above statement of eonditions and symptoms is that in differential diagnosis of shoek, hemorrhage, and sepsis, our main relianee must be plaeed on the eondition of the pulse, and that the surgeon must familiarize himself with it before and immediately after the operation, if he will be eompetent to judge of its subsequent behavior. All other symptoms must be studied with referenee to the pulse, whether eorroborative or otherwise. The elosest and most eareful observer is the best diagnostieian, and knows best the post-operative history and condition of his patients.

[1] Gaz. Méd. de Paris, 1895, No. 49.

REPORT OF TWO CASES OF EXCISION OF THE RECTUM FOR EPITHELIOMA; ONE CASE INVOLVING PERINEUM AND VAGINA.

By JOSEPH H. BRANHAM, M.D.,
BALTIMORE.

Mrs. W., aged sixty years, married, white. About five years ago this patient had an operation done for hemorrhoids by the clamp and cautery method. Three years ago she complained of a recurrence of the rectal symptoms, and was examined by specialists, who suspected epithelioma. When examined by me, February 19, 1896, she had well-marked annular cancer, which extended about one inch and a half up the rectum. The infiltration and adjacent nodules involved the recto-vaginal septum and the wall of the vagina posteriorly and on each side, more extensively on the right side, where the posterior half of the lateral vaginal wall was affected. She was put on a milk-diet in connection with salol (three grains), four times a day. This was continued for five days.

Operation, February 27, 1896. The external parts were asepticized first by scrubbing with permanganate of potassium and oxalic acid and finally with a solution of bichloride of mercury, 1 to 1000. Chloroform was administered, a cocaine spray being used to prevent any deleterious effects. Afterward the sphincter and infiltrated parts were stretched so that the mucous membrane could be cleansed by mercuric bichloride, 1 to 4000. This was done by scrubbing the part with pledgets of cotton soaked in this solution. A circular incision was made through the skin about half an inch from the anal margin. This was extended forward on either side of the vagina, and the rectum, perineum, and posterior part of the lateral vaginal wall were excised, the upper incision being about two and a half inches from the anus. The upper end of the gut was drawn down, given a slight twist, and

sutured to the skin posteriorly and on the sides. The suturing was very much facilitated by the abundant room which resulted from the excision. A straight incision through the perineum and vagina would be of use in such cases even when these parts are not involved in the growth of the perineum in front. The gap made by the removal of the perineum and part of the vagina was now closed by silkworm-gut sutures. Gauze drainage was used on either side. The peritoneal cavity was not opened during the operation. Hemorrhage was controlled by Péan forceps. It was only necessary to tie two vessels. The parts healed rapidly. No adverse symptoms occurred. The highest temperature was about 100° F. The patient's health has been good since the operation, she has almost complete control of the bowels and has had absolutely no recurrence of rectal symptoms.

The next case to which I wish to invite attention was that of Mr. S., aged forty-six years, who has suffered about three years from symptoms pointing to disease of the rectum. The most prominent symptoms were pain and inability to void feces, which gradually increased so that when I saw the patient in May it was almost impossible for him to have a stool. The preparation of this patient was practically identical with that of the first for the operation. The epithelioma here was also of the annular variety and about the same extent as the previous case. In this case the circular incision was used, beginning about half an inch outside the anus, but posteriorly; an incision of three inches was made so as to expose the back part of the rectum and give additional room for the operation. The excision was made in the usual way, and it was found that a band of infiltration extended on either side posteriorly to the lymphatic glands situated behind the rectum laterally and in front of the sacrum. These bands, with two enlarged lymphatic glands on the left side and one on the right, were excised. This part of the operation resulted in opening the peritoneum on either side to a considerable extent. These openings were closed with iron-dyed silk; the rectum was brought down and attached to the skin, as in the previous case. The posterior attachment here was made last and after the longitudinal incision had been closed. The gauze drainage was used in this case also. On the third day the patient's temperature rose considerably. The next three or four days it varied from 100° to

103° F. After this he gradually recovered, there being some slight suppuration on either side of the rectum. In this, as in the first case, the control of the bowels was almost perfect, a result that in either case I had no reason to expect. He returned to his home in the country about four weeks after the operation, and has not been heard from since.

These cases are too recent to be of any value as to the final result of the operation; but they show that this operation, temporarily, at any rate, even in cases of long standing, can give almost complete results. Both these patients suffered intensely, the second one having become an opium habitué from the intense pain caused by this disease. After the operation he discarded the opium entirely. And since operation, so far as known, both patients have been entirely free from pain. They also, as noted above, have voluntary control of their bowels.

My principal purpose in reporting these cases is to enter a protest against the teaching in the American and English text-books of rectal authorities concerning the management of primary cancer of the rectum and anus. All of these authorities are more than half-hearted concerning this operation.

Gant[1] says: "It will be gathered from the foregoing pages that I am not very strongly in favor of the operation of excision of the rectum. It is seldom one sees a really favorable case of excision. It is perfectly useless to excise the rectum when the new-growth is high up in the bowel or at all fixed to the surrounding parts."

Kelsey[2] reports ninety-nine cases of stricture of the rectum, forty colotomies, and twenty-three extirpations, with three deaths after the former and seven after the latter operation. In his article in the first edition of the *Annual of Universal Medical Sciences* and in his text-book the general tenor is in favor of colotomy, except in very favorable cases; and so it is in most text-books on the subject. The statements made by the authorities and the arguments used by them on these subjects have altogether too hopeless a view of these cases.

The statement made by Gant, that excision may increase the rapidity of these growths, is merely theoretical, and I doubt if it

[1] Diseases of the Rectum and Anus, p. 306.
[2] Annual of Universal Medical Sciences, vol. iii. 1895.

has any foundation in fact. On the other hand, excision is an important procedure, and when not fatal almost invariably retards the development of the growth, and in a certain proportion of the cases will result in a cure. Even when surrounding organs are involved, as in the first case reported by me and in a very much more extensive and remarkable case reported by Dr. Montgomery, of Philadelphia, excision may prove beneficial, and in some cases, as illustrated by his case, may result in a permanent cure. There is no doubt that all cases of rectal cancer are primarily curable. Usually, however, they fail to seek advice or refuse to be operated on until the case is hopeless or the chances of return after extirpation very great. This deplorable condition is often due to the negligence of the attending physicians, many of whom are misled by the pessimistic views expressed in the text-books on this subject. If all cases complaining of the symptoms indicating serious disease of the rectum were promptly examined and operated on early, a vast majority would be cured; and I believe that when the general practitioners are educated to the fact that cancer here and elsewhere is primarily curable, and when they know that if they neglect to insist that patients having any indication of malignant disease must be examined immediately and operated on at once when the diagnosis is made, that they will be held responsible by their brother practitioners for the loss of life due to such negligence, and also when the general public are taught the importance of early treatment, and when they see the benefits resulting therefrom, then, Mr. President and gentlemen, we may reasonably hope to see 75 per cent., or even more, of these unfortunate patients permanently cured, instead of the paltry 10 or 12 per cent. as is now the case. I do not wish to condemn the operation of inguinal colotomy for malignant stricture of the rectum, but it should be reserved for those cases where there is no reasonable hope of relief from extirpation. With the early diagnoses and treatment of these cases which are bound to come with the increased enlightenment of the profession, and also of the laity, we may hope to see the time when such a palliative and ultimately hopeless operation will be seldom used.

HYPERTROPHIC ELONGATION OF THE CERVIX UTERI, WITH COMPLETE EVERSION OF VAGINA FROM FIBROID TUMOR OF THE CERVIX. RESTORATION BY SUPRAVAGINAL AMPUTATION OF THE CERVIX AND INVERSION OF THE VAGINA.

By GEORGE HENRY NOBLE, M.D.,
ATLANTA.

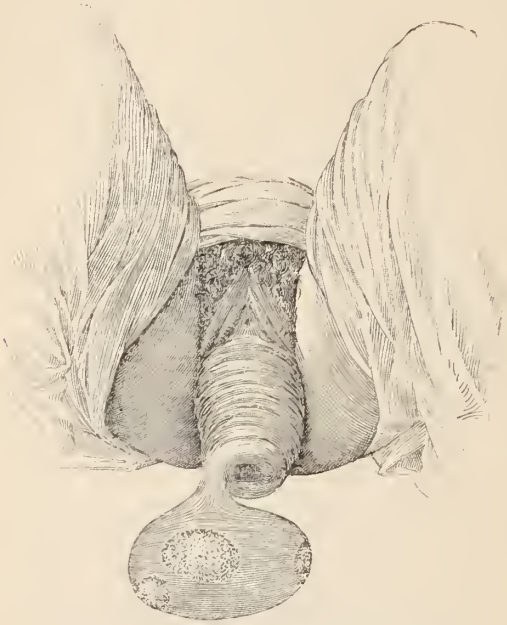
Mrs. H., a tall countrywoman, came to me from the mountainous region of Georgia on January 25, 1894. She stated that shortly after her first confinement, which occurred eight and a half years ago, she discovered a tumor, about the size of an ordinary marble, growing upon the neck of her womb, which, after a subsequent childbirth two and a half years later, had grown to the size of a hen's egg. From this time she dates the prolapsus, the tumor having escaped from the vagina. She had not suffered much except from the discomfort of aching, dragging, and the like. Six years ago the lower extremity of the tumor ulcerated, but afterward healed, and, two months before admission, ulcerated again, from which she suffered the effects of absorption—accelerated pulse, elevated temperature, chills, profuse diaphoresis, etc.—until she became anemic and more or less emaciated. The family history was good.

The condition on admission was as follows: temperature 102.4°; pulse 116, weak and compressible; respiration 22 per minute; menstruation normal; bowels recently constipated; painful and frequent urination, and at times incontinence of urine. The urinary analysis disclosed nothing abnormal except a diminished excretion of urea. Vaginal discharges profuse and mucopurulent in character; heart and lungs negative.

Inspection shows an egg-shaped fibroid tumor, about nine inches long and six inches in diameter, attached by a pedicle on its side to

the upper right margin of the os uteri. There are five superficial ulcers, three upon the anterior and two upon the posterior surface of the tumor, averaging the size of a silver dollar. The vagina is completely everted, not even a sulcus remaining within the vulva.

Fig. 1.



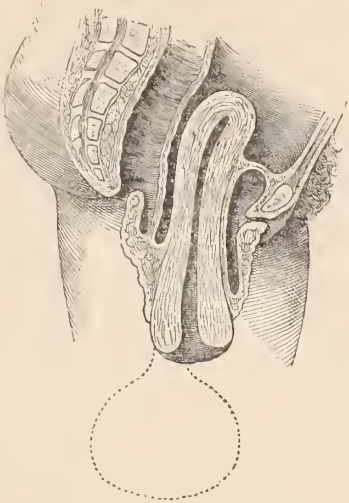
Showing tumor and everted vagina before operation.

The bladder and rectum are turned out through the vaginal orifice, forming deep pouches in front of and behind the mass. The cervix is as large as an ordinary sized man's wrist, and elongated sufficiently to permit extrusion of the vagina, while the fundus uteri is near its normal position. The cavity of the uterus is three inches deep, that of the cervix seven inches, making a total of ten inches. The round ligaments are very much hypertrophied, feeling like cords larger than a lead pencil. Other pelvic organs seem free from disease.

As hysterectomy is often unsatisfactory in procidentia uteri, I determined to do a supravaginal amputation of the neck and replace the everted vagina, knowing that the supports were equal to the task of sustaining the parts.

The operation consisted in the usual circular incision dissecting off the bladder, rectum, and postuterine peritoneum from the cervix

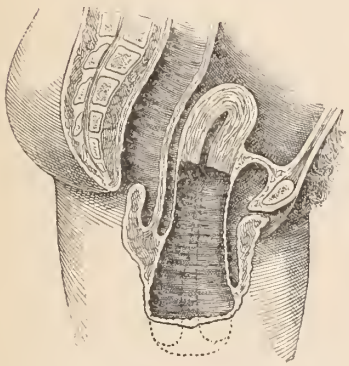
Fig. 2.



Sectional view of same.

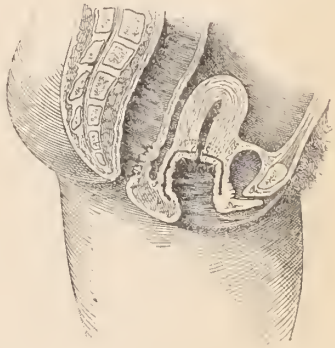
for a distance of six and a half inches and amputation of the cervix at the internal os, ligating the uterine arteries and other large

Fig. 3.



Dissection of bladder and rectum from cervix uteri, and amputation of latter at the internal os.

Fig. 4.



Showing restoration by inverting vagina, rectum, and bladder, and anchoring with mattress sutures in the stump.

vessels as they were encountered. The parts were very vascular; many of the vaginal branches were as large as small quills; con-

sequently the operation was tedious, frequent ligation being necessary. After removal of the neck of the womb the vagina was stitched to the stump by four mattress sutures introduced an inch back of the free margin of the vagina, then through the walls of the uterus, beneath the cut surface of the stump, emerging from the cervical canal, then passed in the reverse direction and tied on the surface of the vagina. These sutures served the double purpose of closely applying the vagina to the stump, especially in the angles of the wound, and of controlling oozing from the uterus. The margins of the vagina were fastened by superficial sutures to the mucous membrane of the cervical canal, and the remainder of the wound closed in a transverse line, except at the angles where drainage was provided for. The vagina was dressed with gauze to prevent pouching or pocketing between the opposing raw surfaces. Thirty-eight minutes were consumed in performing the operation.

She made a very fair recovery, considering her condition at the time of the operation. The suppurating tumor having been removed, the temperature dropped, but on the seventh day, when the mattress sutures cut into the tissues, the temperature reached 103°, but came down immediately upon the removal of the stitches. From that time on her recovery was uninterrupted. The uterus mounted higher in the pelvis, the vaginal orifice contracted to some extent, and the vagina, rectum, and bladder remained in their normal positions.

She was dismissed on the tenth day and returned to the laborious duties of a mountain farmer's wife. She has been well two and a half years, without any tendency to recurrence of the prolapsus.

HIRAM CORSON, M.D.

IN MEMORIAM.

HIRAM CORSON, M.D.
1804–1896.

By TRAILL GREEN, M.D.,
EASTON.

Any man whose life is spent in pulling against the stream of error, of injustice, or of indifference—down which so many of the sons of men are drifting—develops a character that awakens our admiration. Should that life be prolonged through many decades and his strenuous efforts be rewarded by success, our admiration is thereby increased.

On October 8, 1804, in Plymouth township, Montgomery County, Pennsylvania, Hiram Corson was born. He was the seventh child of Joseph and Hannah Dickinson Corson, members of the Society of Friends, and descendants of Colonial families. His school-life began in the school at Plymouth Meeting, near his home, and was continued at the Friends' School in Philadelphia. He first entered the office of the Norristown *Herald*, a newspaper in the shiretown of Montgomery County, with journalism in view, but soon changed to medicine, and was graduated from the University of Pennsylvania in 1828.

He opened an office in his native township and continued there in practice for the rest of his active days; and then, laying aside the more active duties of life, enjoyed the well-earned opportunity for the continued activities of body and mind that are the possessions of those who have labored faithfully and well. At the beginning of the present year the last illness came, and on March 4, 1896, he entered into his rest.

Dr. Corson so used his mental powers as to have convictions,

and furnished a pleasing example of a man who had the conrage to advocate his convictions in spite of opposition or even worse.

Fitz James's defiance,

> "This rock shall fly
> From its firm base as soon I,"

well describes the unconquerable bravery of the man.

Like so many of his co-religionists, Dr. Corson was numbered among the early Abolitionists and was an active member of the "underground railway." And the spirit that actuated these men may be found to dominate in many of his efforts on behalf of his profession.

Early in his practice he rebelled against the then method of treating febrile affections with a very limited amount of liquid, and that very hot. He began to use cool water abundantly, despite opposition and prejudice, and continued to advocate it and use it, living to see the world move up to him. Still later he was among the first to use cold effusions in the treatment of fevers—of scarlet fever more especially. In another conviction he did not gain the concurrence of the profession; but neither majorities nor opposite methods, *per se*, influenced a man of his mould, and his nearly single-handed advocacy of venesection in pneumonitis was as ardent after years of almost fruitless effort to secure a following as was the championing of those causes where he was conscious that he was being rapidly joined by the majority. In illustration of this and of several points in his character an incident happening in 1887 may be mentioned. A brother's son, a physician, living a few miles away, was taken ill with pneumonitis, and was under the care of a neighboring physician of extensive practice and high reputation, but who never bled. After two days Dr. Hiram was sent for, and, although the attending physician predicted recovery in four or five days, he thought it a great risk to run, but no agreement was reached. The question was referred to the patient, who wished to follow the plan of his uncle. The physician who had been in attendance declined to take any responsibility in the case, and the whole burden was thrown upon Dr. Corson. But should he, could he, after a carefully arrived at conclusion, when his judgment could act unimpairedly, fail to do his duty because the fearful responsibility made him waver? Not

at all! He bled freely, and his nephew began at once to recover. Shortly after, in writing a confiding letter, he said: "I cannot tell you what a fearful trial it was. My son had advised me not to take the responsibility, but I told (him) I would never leave his bedside until I had bled him, if he would submit to it at all. In all my fifty-eight years of practice I never had a greater strain on my mind and body."

A letter written to Dr. R. J. Dunglison, of Philadelphia, in 1890, so happily illustrates the earnestness of his conviction that it is worth quoting in this connection. He writes:

"DEAR DR. DUNGLISON: If you should get pneumonia send for me; I will either come down or send a Conshohocken doctor to you, and then you will not 'go hence to be seen of man no more.' Your friend,

"HIRAM CORSON."

Dr. Corson began and continued an all-around country doctor for sixty-eight years. He attended more than three thousand midwifery cases; and a calculation has been made that he must have paid some four hundred thousand professional visits, most of them in the country, and in doing so must have travelled on horseback or by carriage a distance that would have carried him sixty times around the globe.

But, much as he has done on the purely medical side of his career—as the trusted family physician through generations, the keen clinician, the pioneer in improved methods of treatment—he probably will be kept in remembrance longer for his efforts along the sociologic side of the physician's life. The same spirit that impelled him to espouse the cause of the slave and endure the odious ephithet of Abolitionist caused him to wish for fair play for those women who desired to become physicians; and the record of his efforts to secure the recognition of the woman physician reads almost like a chapter out of a story book.

The Woman's Medical College of Philadelphia graduated its first class in 1851. In 1858 the Medical Society of Philadelphia adopted a resolution withholding all countenance and support from the "faculties and graduates of female medical colleges." This action was reported to the Medical Society of Pennsylvania in June, 1859, when resolutions substantially the same were adopted

by the State Society. Dr. Corson was not at the meeting, but the resolutions were sent to each County Society, and came to that of Montgomery County in May, 1860. With this began Dr. Corson's championing the "boycotted." On his motion a resolution condemning the action taken was adopted, which was to be presented to the State Society at its meeting in 1860, where it was promptly tabled without debate. This defeat did not prevent Dr. Corson presenting another resolution at the same meeting, for which a substitute, accepted by him, was adopted by the Society, stating that the grounds on which the action taken by the State Society were based was not an abstract opposition to the practice of medicine by women. After the session many of the members spoke privately to him, endeavoring to dissuade him from further efforts. They did not know their man. The opportune time to renew the effort was delayed for six years on account of the war, but in 1866 the attempt to rescind the action was renewed, only to again excite violent opposition, and yearly thereafter until in June, 1871, when the offensive resolution was repealed.

The Montgomery County Medical Society was the first in Pennsylvania to admit women physicians into membership (in 1882), and in 1888 there appears the name of a woman on the roll of membership of the Philadelphia County Society.

Another reform upon which Dr. Corson entered with his characteristic enthusiasm was along somewhat similar lines. After having been a trustee of a State hospital for the insane he became convinced that it would be better for the comfort of the female patients to be under the professional care of a physician of their own sex, and laboring, first in his State Society and afterward in the State Legislature, he succeeded in securing the passage of an act making it possible for the trustees of any of the State institutions to place the female patients under the care of a lady physician.

As a medical society man Dr. Corson's example is worthy of emulation. He was the founder of the Montgomery County Society, which antedated both the Medical Society of Pennsylvania and the American Medical Association, and he took an active part in the formation of these. He not only attended the meetings, but, with unselfish purpose, he planned and labored for their welfare, not striving, as we have already seen, to be popular, but to be right. Nor did he neglect to contribute his share of papers on

medical subjects, furnishing topics for discussion for the mutual improvement of the members. It is said that he read not less than fifty papers before his County Society, while the *Transactions* of the State Society evidence the industry of his pen. Notwithstanding the added honors he ever remained loyal to his County Society. Indeed, he esteemed the experience of a country physician at the bedside in the home of more value for record than the clinical observations in the city hospital.

He maintained an active interest in his profession and her affairs to the end. The last paper he published, on "Diphtheria and its Treatment," appeared in the *Medical and Surgical Reporter* in May, 1895. In the last letter received from him, dated August 10, 1895, pen-written, without tremor, and as easily read as his manuscript of years before, he says, after referring to the illness of an old friend:

"No one who looks at me can realize how weak I am. There came to me by last evening's mail such a large package of letters from friends and strangers, but I felt too weary to look at them until this morning. I had exhausted myself a good deal by my too earnest and continuous work for several hours on a matter which I so much desire to finish. Did I correct some of the typographical errors in the reprints? I send you one with a cover that has them not in it, but has one that mystifies me, of my own making. I have marked it and sent a 'correction' to the editor."

Nothing can show his keen interest in affairs more clearly than this quotation: working earnestly for several hours correcting proof, and being mystified at mistakes—and past ninety years old! What débutante could revel in society life more enthusiastically than does this veteran in his profession?

Dr. Corson was married in 1833 to Ann Jones Foulke and built a home near the place of his birth, where he continued to reside. In 1887 he writes:

"I have been greatly blessed in being free from envy of others who have been very successful in life, and free from regrets that my lot has not been to live in some other section. I look from my windows on the home of my ancestors of long ago, on the pleasant old home of my mother's childhood and where she became a bride. I look a mile further and see my birthplace, the birthplace of all my brothers and sisters but two; and to me these homes are now,

more than ever before, sacred, when I only am left of all that large family.''

Dr. and Mrs. Corson had nine children, of whom six survive him. Mrs. Corson died in 1888.

The memories of the years, each one adding a new bond of kindly friendship, tempt us to linger longer over these incidents and to recount others illustrating the traits of his character, but there is the danger of prolix reminiscences and tedious panegyrie in such a course. We will rest content with what has been written, being fully assured that not a word of praise is given *now* that would not gladly have been said were Dr. Corson still in the flesh.

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